# APPLICATION FOR THE CLEAN OHIO CONSERVATION FUND
## SUMMARY SHEET

CB CAG

APPLICANT: Hamilton County Park District CODE # 061-02037

DISTRICT NUMBER: 2 COUNTY: Hamilton DATE 7/29/05

CONTACT: Ross Hamre PHONE # (513) 728-3551, Ext. 256

FAX: (513) 521-2896 E-MAIL rhamre@greatparks.org

PROJECT NAME: Whitewater River Bank Stability Project

**ELIGIBLE APPLICANT**
(Check Only 1)

__ A. County (1)
__ B. City (2)
__ C. Township (3)
__ D. Village (4)
__ E. Conservancy District (6)
__ F. Soil & Water Conservation District (7)
__ G. Joint Recreational District (8)
X H. Park District/ Authority (9)
__ I. Nonprofit Organization (10)
__ J. Other_____ (11)

**PROJECT TYPE**
(Check Largest Component)

_____A. Open Space (7)

__X__B. Riparian Corridor (8)

**PRIMARY PROJECT EMPHASIS** 9, 7, 8

9. Preserves or restores natural stream channels
7. Preserves or restores flood plain and stream side forest functions.
8. Preserves or restores water quality.

**ESTIMATED TOTAL PROJECT COST** (from 1.1f): $478,351.00

**CLEAN OHIO CONSERVATION FUNDING REQUESTED:** (from 1.2e) $353,980.00

**NRAC APPROVAL - To be completed by the NRAC Committee ONLY**

GRANT: $_____

**FOR OPWC USE ONLY**

PROJECT NUMBER: _____

Local Participation _____%

Clean Ohio Fund Participation _____%

APPROVED FUNDING: $

Project Release Date:

## 1.0 PROJECT FINANCIAL INFORMATION

### 1.1 PROJECT ESTIMATED COSTS:
(Round to Nearest Dollar)

| | TOTAL DOLLARS | In Kind Dollars (See definition in instructions.) |
|---|---|---|
| a.) Acquisition Expenses: | $ .00 | |
| Conservation Easement Purchase | $ .00 | |
| Easement Purchase | $ .00 | |
| Other Earnest Money | $ .00 | |
| b.) Planning and Implementation: | $ 45,925.00 | |
| Survey/topographic base map | $ 4,668.00 | |
| Geotechnical Investigation | $ 4,374.00 | |
| Consultation Fees | $ 2,874.00 | |
| Hydrologic/Hydraulic | $ 4,624.00 | |
| Civil Design | $ 6,048.00 | |
| Plans/Specifications | $ 23,337.00 | |
| c.) Construction or Enhancement of | $ 394,212.00 | |
| Site Preparation | $ 99,000.00 | |
| Bank Protection | $ 130,700.00 | |
| Site Reclamation | $ 48,500.00 | |
| Riparian Reforestation | $ 52,800.00 | |
| Bonding/Construction Services | $ 63,212 .00 | |
| d.) Permits, Advertising, Legal: | $ .00 | |
| e.) Contingencies: (not to exceed 10% of total costs) | $ 38,214.00 | |
| f.) **TOTAL ESTIMATED COSTS:** | $ 478,351.00 | |

## 1.2 PROJECT FINANCIAL RESOURCES:

(Round to Nearest Dollar and Percent)

| | | DOLLARS | % |
|---|---|---|---|
| a.) | In-Kind Contributions | $ .00 | |
| | (Please define)_____ | | |
| b.) | Applicant Contributions (Local Funds) | $ 124,371.00 | 26% |
| c.) | Other Public Revenues | | |
| | Nature Works | $ .00 | |
| | Land Water Conservation Fund | $ .00 | |
| | Ohio Environmental Protection Agency | $ .00 | |
| | Ohio Water Development Authority | $ .00 | |
| | Community Development Block Grant | $ .00 | |
| | Ohio Department of Natural Resources | $ .00 | |
| | OTHER_____ | $ .00 | |
| d.) | Private Contributions | $ .00 | |
| ***SUBTOTAL LOCAL RESOURCES:*** | | $ 124,371.00 | |
| e.) | **CLEAN OHIO CONSERVATION FUND:** | $ 353,980.00 | 74% |
| | **Funds from another NRAC** | $ .00 | |
| ***SUBTOTAL CLEAN OHIO RESOURCES:*** | | $ 353,980.00 | |
| f.) | **TOTAL FINANCIAL RESOURCES:** | $ 478,351.00 | 100% |

## 1.3 AVAILABILITY OF LOCAL FUNDS:

Please list any partnership with other sources. (i.e.; is this part of a larger project or plan):

_____

_____

_____

_____

# 2.0 PROJECT INFORMATION

If the project is multi-jurisdictional, information must be consolidated in this section.

X *Please check here if additional documentation is attached.*

## 2.1 BRIEF PROJECT DESCRIPTION - (Sections A through E):

A: SPECIFIC LOCATION: Please attach a map.

PROJECT COUNTY: Hamilton PROJECT ZIP CODE: 45030

B: PROJECT COMPONENTS: Please describe the various project components.

C: PROJECT EMPHASIS AS DEFINED BY SECTIONS 164.22 (A) (B) OF THE OHIO REVISED CODE AND LISTED IN APPENDIX A: Please describe.

D: DEFINE TERMS OF EASEMENTS:
PLEASE REFER TO SECTION 164.26 OF THE OHIO REVISED CODE.

E: INFORMATION REGARDING PUBLIC ACCESS

Where is the access located? Is it open to the general public or are there restrictions? What are the hours of availability? Will the general public be given the opportunity to participate in the planning of the project?

## 2.2 OWNERSHIP/MANAGEMENT/OPERATION: Please address.

## 2.0 Project Information

## 2.1 Brief Project Description

A. **Specific Location:** The Whitewater River Bank Stabilization Project is located within a Hamilton County Park District property on Kilby Road. This property is located in the OPWC District 2, in western Hamilton County, north of Highway 275 and west of Kilby Road along the Whitewater River approximately 3.5 miles upstream of the confluence with the Great Miami River. See Exhibit 1. The disturbed bank site lies within the Great Miami River Watershed and Great Miami Aquifer.

B. **Project components**: ***Describe the project:*** This application involves the stabilization of an approximately 600' long, 20' high eroded bank along the Whitewater River and the restoration of a 3 acre area in the riparian corridor adjacent to this bank site. The site is located on the Kilby Road property. See Exhibit 2 for the site location and riparian area to be restored.

The Park District purchased the Kilby Road property in 2001 from the Martin Marietta Corporation (MMC). The riverbank had been restored by MMC after being mined for gravel. Martin Marietta attempted to stabilize the bank in 2001 by grading the 20' high bank to an angle of about 1:5:1 (H:V) and covered it with an erosion control blanket consisting of synthetic fibers held together with a polypropylene mesh net and held in place with willow stakes. Despite this repair, subsequent high flows on the river quickly eroded the bank slope to near vertical conditions. It was apparent that more effective measures were needed to stabilize this bank.

The Park District hired Mainstream Restoration, Inc. (MRI) in 2004 to assess the potential for continued river migration and to present preliminary recommendations for riverbank stabilization and future steps.

MRI reviewed aerial photos of the site spanning 75 years and discovered that this stretch of bank has moved as much as a hundred feet to the west and a hundred feet to the east in last 60 years, at rates of movement up to 10 feet annually. Since the Park District purchased this property, the bank has continued to deteriorate and evidence shows that it is likely it will continue if action is not taken.

A second component of this application is the restoration of a 3-acre riparian area that has been rented to a farmer by the Park District for crop production. The HCPD will contract with a company to perform the restoration work under the supervision of the HCPD land management staff.

MRI is a nationally recognized expert in the discipline of bioengineering and travels extensively throughout the United States to work with clients to repair stream environments. MRI worked with the Park District on the Lake Isabella Bank Restoration Project which involved repairing an extensively eroded area on a 34 foot high bank that separates the Little Miami Scenic River from Lake Isabella, another Park District facility. Their recommendations were followed and the bank has been holding up well to stress from the river's migration and vegetation continues to establish itself. The project was completed in 2000.

In addition to the active preservation and restoration on site, the HCPD will ensure that the Whitewater River riparian corridor across from and south of the bank disturbance area, as illustrated in Exhibit 2, will remain in a protected state as defined by the Ohio Public Works Clean Ohio Deed Restrictions.

***Project Components:***
MRI evaluated the condition of the bank along the Whitewater River on the Kilby Road property and provided a preferred recommendation which includes the following actions.

***Additional Professional Services***
The preliminary report prepared by MRI outlined a course of action to repair the erosion with the notation that further investigation is necessary in the areas of hydrologic, hydraulic, civil design, geotechnical and surveying to refine the plan's execution, design and extent of work. Generally, however, MRI recommended reinforcing the bank through the installation of barbs and native plantings. This alternative will be refined through additional engineering.

***Whitewater River Bank Restoration Plan – MRI alternative***
**Barb installation with native plantings**

**Site Preparation –**
Erosion Control – Silt fencing would be used as an erosion control measure during construction to minimize the contribution of sediment. It is likely that silt fence would be placed in one location during the initial phase of construction and then resituated as construction proceeds. In that way, runoff from the site would be intercepted prior to flowing to the river.

Invasive Plant Removal – There are existing asian honeysuckle and musk thistle along, and adjacent to, the bank area that will be removed before work begins.

Grubbing, topsoil removal and stockpiling – All surface objects, brush, roots, and other protruding obstructions, not designated to remain shall be cleared and/or grubbed. Topsoil will be removed from the restoration area and stockpiled until it is replaced on the site.

Construction dewatering – Construction dewatering would include measures to undertake excavation in and along the river in a setting where turbid water and sediment would not be contributed to the river. Based on the dewatering measures used on similar projects, including the work undertaken on the Little Miami River at Lake Isabella, it is likely that dewatering would involve barricading the reach of river with some type of cofferdam system to separate flowing water from standing water. Excavation to place bank protection below the water level would occur in wet conditions, but where turbid water would be contained. Following placement of rock below the water level, the barricades would be removed. The final design of this siltation barrier will be developed upon further evaluation of the site.

Channel rock removal – there is a line of large concrete blocks within the channel that remain from an earlier failed bank stabilization performed by Martin Marietta

which will be removed. The collection of concrete blocks at the upstream end of the site are also recommended to be removed. These features have the potential to exacerbate the current instability problem, and could certainly adversely affect the proposed bank protection.

**Access Road** –
Due to the regrading on the site, the existing gravel access road along the bank will need to be relocated. The road will be relocated east of the current location and further study will determine the exact location of this realignment. By executing this realignment, it will be possible to regrade the berm on site to prevent future flooding on the site and ensure that the access road and potential future bike/hike trail alignment will be secure.

The road's base and top course will be removed and when stabilization is completed, the new gravel road will be reconstructed at a location to be determined after further study.

**Bank Protection** –

Earthwork associated with partial berm removal –
Extensive earthwork will be executed on site to regrade and relocate the existing berm on site. Earthwork will include the relocation of an approximately 8' high berm and the regrading of the streambank to a more gradual slope. The location of the new berm will be determined when final design work is complete. Figure 1 illustrates a preliminary design as to how the streambank will be stabilized using barbs and revegetation and a preliminary design of the streambank's regrading. The toe of the bank will be strengthened using a rock toe. A rock toe is used to shore up erosion-prone sites at the toe of a streambank. Installation of the material requires excavation of the channel bed at the toe, and placement of large hard angular rocks below the level of erosion. Table 1 outlines MRI's preliminary calculations of the bank which looked at the critical shear stress on the river bank from the river flow, the size of the rock required, the size distribution of the rock and filter layers, and the depth of placement.

Once the bank is prepared, a series of barbs will be installed into the bank for stabilization. Native plant material will then be planted on the site for added strength. See figure 2 to see vegetated barbs section.

Table 2 lays out MRI's calculations for the likely shear stress distribution along the stream bank, thereby indicating an appropriate transition elevation from a vegetated rock surface to a vegetated surface temporarily reinforced with biodegradable erosion control fabric. These calculations will be revisited when final engineering is completed by the consultant.

Barb installation
The preferred solution for this bank repair involves placing a series of barbs along the bank at regular intervals. These structures, protruding into the flow to reduce bank erosion, are also called bendway weirs. These are low-elevation structures placed at specific intervals, angled slightly upstream, and designed to redirect flow away from the bank. In general, after a period of time, a riverbank treated with barbs becomes stable and provides conditions where riparian vegetation becomes

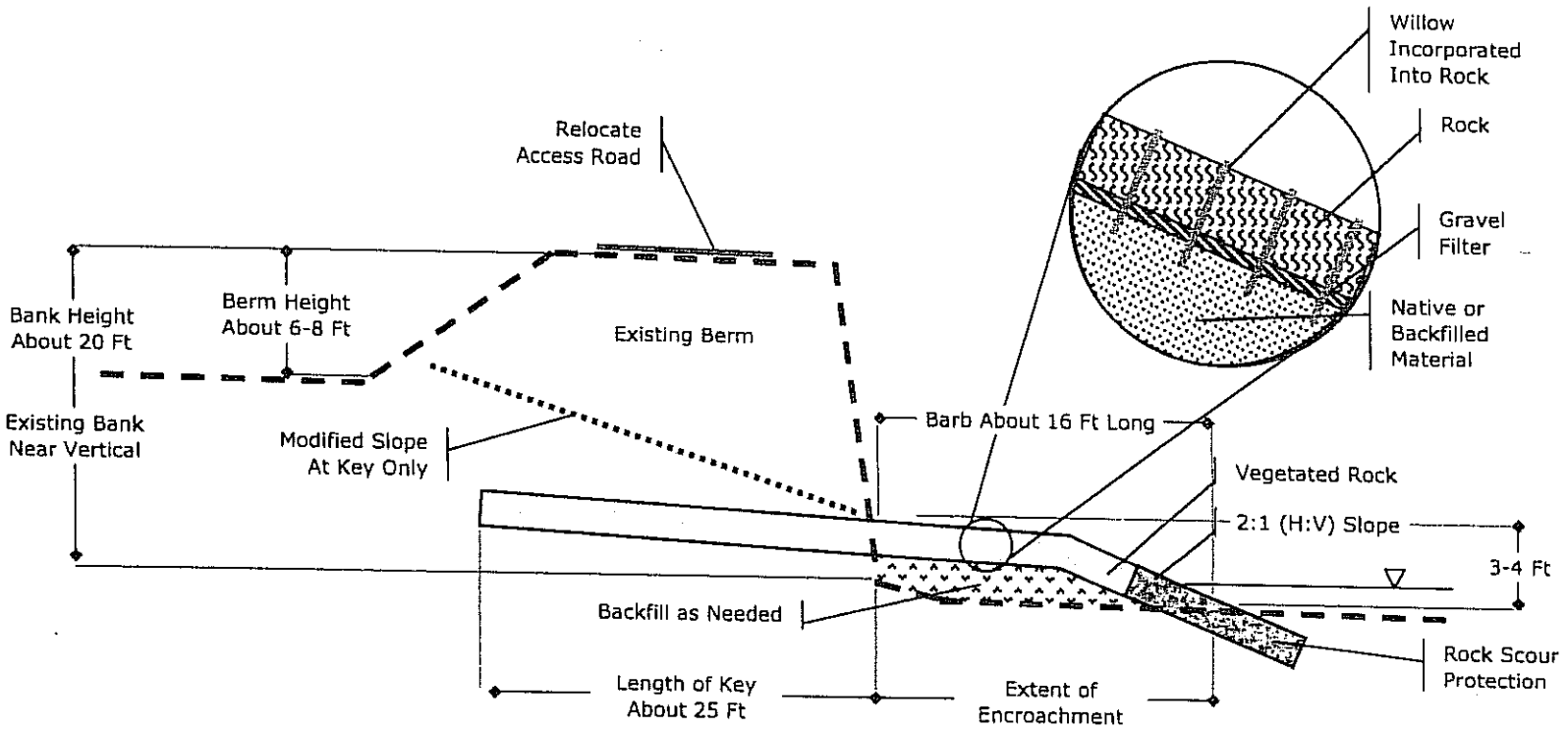



Figure 1. Cross-section of river bank stabilized with vegetated barbs.

**Figure 1**

# Table 1

Design of rock toe along the riverbank of the Whitewater River at the Kilby Road property.

**Site Location**

Stream: Whitewater River
Location: Kilby Road Property
Discharge: @ 100-Year Flow
Max WSE: 491 Feet
Bed Elevation: 470 Feet

Input Data
Calculated Result

**Determine Critical Shear Stress on River Bank**

Maximum Bed Shear Stress = w*d*S
Maximum Bank Shear Stress = 0.76*Maximum Bed Shear Stress

where:

| | | | |
|---|---|---|---|
| w = | 62.4 | lbs | weight of water (lbs), a constant |
| d = | | ft | depth |
| S = | | ft/ft | channel slope |

to solve:

| | | | |
|---|---|---|---|
| w = | 62.4 | lbs | weight of water (lbs), a constant |
| d = | 21 | ft | depth |
| S = | 0.001 | ft/ft | channel slope |

Maximum Bed Shear Stress = 1.31 lb/ft2 <---
Maximum Bank Shear Stress = 1.00 lb/ft2 <---
*Maximum Bank Shear Stress Is 1.00 lb/ft2*

**Determine Appropriate Rock Toe Size**

Determine Angle of Repose of Angular Rock:
D50 = 12.0 inches assume, then check
Angle of Repose = 42.0 degrees from HEC 15 page 49

Determine K1 Factor:
Constructed Bank Angle = 2:1
K1 = 0.74 from HEC 11 page 128

Determine D50:
D50 = depth*(stability factor/Shields Parameter)*(slope/K1/(specific gravity rock-1))

where:

| | | | |
|---|---|---|---|
| depth = | 21.0 | ft | from above |
| stability factor = | 1.80 | | from HEC 11 page 31 assuming ice and waves |
| Shields Parameter = | 0.030 | | from HEC 11 page 145 |
| slope = | 0.0010 | ft/ft | from Floodplain Study, USGS quad |
| K1 = | 0.74 | | from above |
| specific gravity rock = | 2.65 | lbs | assumed |
| D50 = | 1.03 | ft | <--- |
| D50 = | 12.38 | in | <--- |

*Rock Toe With a D50 of 1.03 Feet Should Be Used*

**Determine Rock Toe and Filter Gradation and Installation Depth**

ROCK TOE
$D_{50}$ = 12.38 inches

| Installation Depth = 1.5*D50 *18.6* *Inches* | Stone Size (in) | | | Percent of Gradation Smaller Than |
|---|---|---|---|---|
| | 18.6 | to | 21.1 | 100 |
| | 14.9 | to | 17.3 | 85 |
| | 12.4 | to | 14.2 | 50 |
| | 5.0 | to | 7.4 | 15 |

SUBLAYER
$D_{50}$ = 1.50 inches

| Installation Depth = 1.5*D50 *2.3* *Inches* | Stone Size (in) | | | Percent of Gradation Smaller Than |
|---|---|---|---|---|
| | 2.3 | to | 2.6 | 100 |
| | 1.8 | to | 2.1 | 85 |
| | 1.5 | to | 1.7 | 50 |
| | 0.6 | to | 0.9 | 15 |

3.2 = $D_{15}$ (course layer)/$D_{85}$ (finer layer) [<5 desired]
8.3 = $D_{15}$ (course layer)/$D_{15}$ (finer layer) [>5 and <40 desired]
from HEC 11 page 38

**Check If Estimated Velocity Appears Reasonable**

Estimate Velocity:
V = 15.0 ft/sec from HEC 11 page 126
*Velocity Appears High for the Site*

**Check If Rock Size Is Greater Than Permissible Shear**

Permissible Shear Stress = 4*d50 from HEC 15

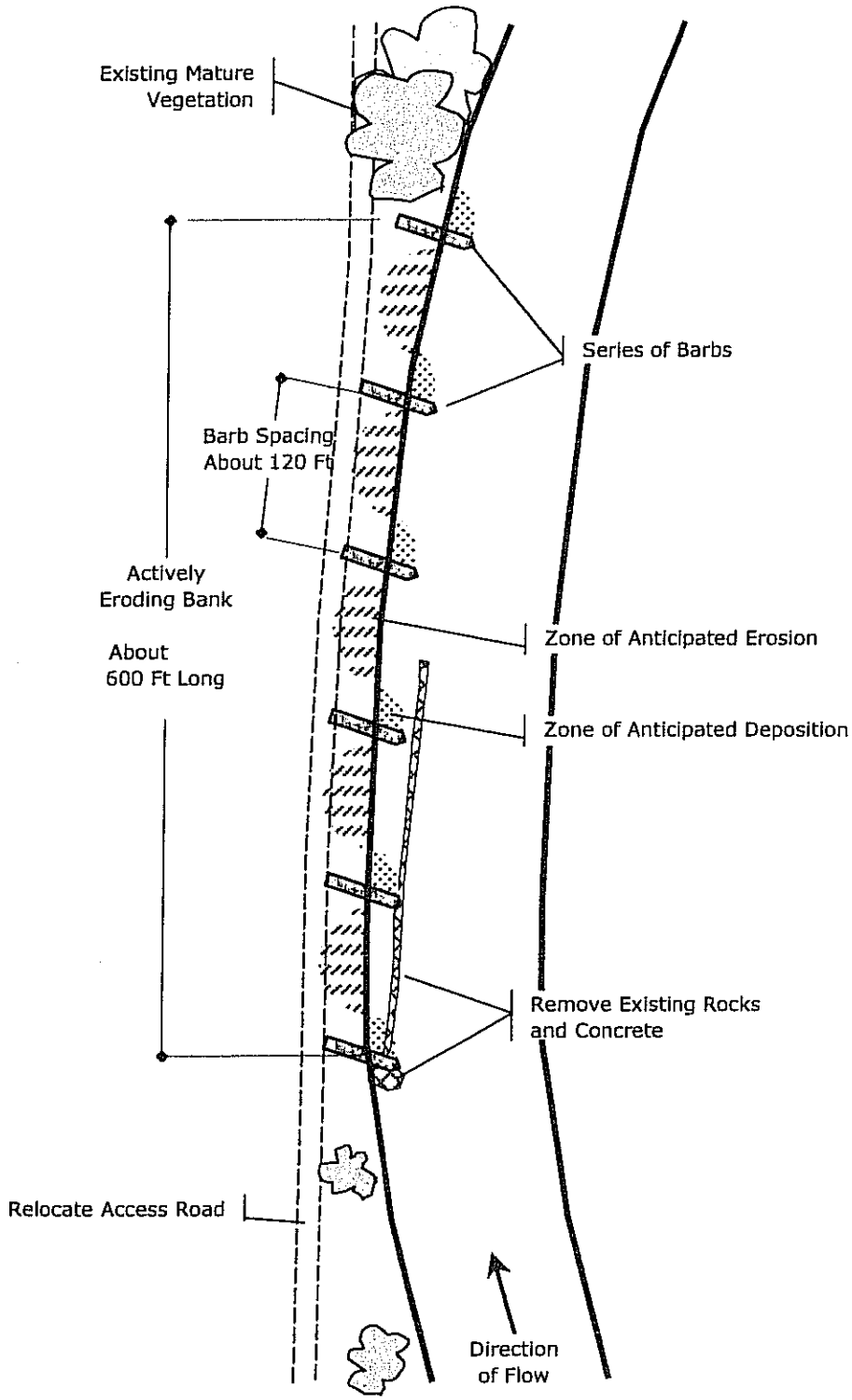
where:

| | | | |
|---|---|---|---|
| d50 = | | feet | particle diameter |

to solve:

| | | | |
|---|---|---|---|
| d50 = | 1.03 | feet | particle diameter |
| Permissible Bed Shear Stress = | 4.13 | lbs/ft2 | <--- |
| Permissible Bank Shear Stress = | 3.14 | lb/ft2 | <--- |

*Permissible Bank Shear Stress is Greater Than Critical Bank Shear Stress*
*By a Factor of: 3.2 Meaning the Rock Will Be Stable*




Plan of river bank stabilized with vegetated barbs.

**Figure 2**

# Table 2

Vertical distribution of shear along the riverbank at the Kilby Road property.

**Site Location**

| | | |
|---|---|---|
| Stream: | Whitewater River | |
| Location: | Kilby Road Property | |
| Discharge: | @ 100-Year Flow | |
| Max WSE: | 491 | Feet |
| Bed Elevation: | 470 | Feet |

Input Data

Calculated Result

**Determine Vertical Shear Stress Distribution on River Bank**

Bank Shear x Distance From Bed = C*Max Bank Shear — from Integrated Streambank Protection Guidelines Hydraulic Appendix

where:

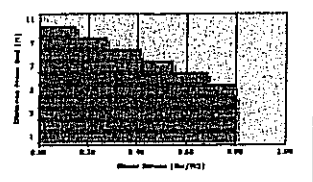
C = Coefficient

Maximum Bank Shear = 1.00 — from previous spreadsheet

Maximum Wetted Bank Height = 21 — from previous spreadsheet

| % of Depth | Distance From Stream Bottom | C | Bank Shear |
|---|---|---|---|
| 0% | 0.0 | 0.80 | 0.80 |
| 10% | 2.1 | 0.80 | 0.80 |
| 20% | 4.2 | 0.80 | 0.80 |
| 33% | 6.9 | 0.80 | 0.80 |
| 40% | 8.4 | 0.79 | 0.79 |
| 50% | 10.5 | 0.68 | 0.68 |
| 60% | 12.6 | 0.54 | 0.54 |
| 67% | 14.1 | 0.41 | 0.41 |
| 80% | 16.8 | 0.27 | 0.27 |
| 90% | 18.9 | 0.14 | 0.14 |
| 100% | 21.0 | 0.00 | 0.00 |

Shear Along Bank



**Determine Appropriate Rock Size By Depth (Assuming Continuous Placement)**

Determine Angle of Repose of Angular Rock:

D50 = 12.0 inches — assume, then check

Angle of Repose = 42 degrees — from previous spreadsheet

Determine K1 Factor:

Constructed Bank Angle = 2:1

K1 = 0.74 — from previous spreadsheet

Determine D50:

D50 = depth*(stability factor/Shields Parameter)*(slope/K1/(specific gravity rock-1))

where:

depth = 21.0 ft — from previous spreadsheet

stability factor = 1.80 — from previous spreadsheet

Shields Parameter = 0.030 — from previous spreadsheet

slope = 0.001 ft/ft — from previous spreadsheet

K1 = 0.74 — from previous spreadsheet

specific gravity rock = 2.65 lbs — assumed

| % of Depth | Distance From Stream Bottom | D50 (ft) | D50 (in) |
|---|---|---|---|
| 0% | 0.0 | 1.03 | 12.4 |
| 10% | 2.1 | 1.03 | 12.4 |
| 20% | 4.2 | 1.03 | 12.4 |
| 33% | 6.9 | 1.03 | 12.4 |
| 40% | 8.4 | 0.62 | 7.4 |
| 50% | 10.5 | 0.52 | 6.2 |
| 60% | 12.6 | 0.41 | 5.0 |
| 67% | 14.1 | 0.34 | 4.1 |
| 80% | 16.8 | 0.21 | 2.5 |
| 90% | 18.9 | 0.10 | 1.2 |
| 100% | 21.0 | 0.00 | 0.0 |

established. Section and plan schematic figures 1 and 2, as prepared by MRI, depict a potential configuration and orientation of barbs at Kilby Road property. This technique will be fine tuned during the final design stage. Based on initial calculations for the design of bendway weirs (Table 3), barbs at the Kilby Road property would likely have the following attributes:

- Six barbs would be used
- Barbs would extend about 16 feet into the channel and 25 feet into the bank for a total length of about 41 feet.
- Barbs would be angled upstream slightly.
- Barbs would be about 3 to 4 feet above the average channel bed.
- The toe of the barb would be rock, likely on the order of 12 inches in diameter or larger.
- The section of barb above the low flow level would consist of rock and would be planted with willows as cuttings or rotted cuttings.
- The berm in the area of the barb would be backsloped, to facilitate installation, while the remainder of the bank would be left intact.

Erosion control fabric placement –
When the barbs are in place, erosion control fabric will be placed on the regraded and engineered streambank to help minimize future streamside sedimentation into the river as shown in Figure 1. Willow sticks will be inserted through the fabric to further aid in holding the bank.

Revegetation –
Revegetation will be implemented at this stage to help stabilize the bank. This will include preparing the ground for seeding and where appropriate, fertilizing and mulching. This will likely be undertaken by hydroseeding or broadcast seeding.

Upstream and Downstream Transitions –
The proposed bank stabilization measures will need to be tied into the existing bank at the up and downstream margins. Typically this involves some level of bank protection designed to transition from relatively soft and erodible native materials to hardened bank protection measures. These transitions might also be configured to orient back into the bank some distance.

**Site Reclamation –**

Grade and landscape spoil materials –
Materials excavated from the eroding slope will need to be moved to a location where they can be blended with the surrounding landscape and revegetated. This would involve identifying a disposal site near the river bank where the excavated materials could be shaped to match existing ground shapes.

The berm along the river will be modified, rendering it no longer functional as a flood control feature. While this berm does not contain the 100- year flow, it does prevent flooding of the adjacent floodplain at lesser floods. The detailed design of the berm height and location will be addressed in the future study of the site.

The construction of the relocated berm will be completed before restoration work begins.

# Table 3

Calculations of bendway weir dimensions for the Whitewater River.

## Bendway Weir Preliminary Design

Based on HEC 23, 1997

**Project:** Whitewater River
**Date:** 5/10/04
**Bend ID:** Kilby Road Property
**Comments:**

W = channel width
L = weir length
S = weir spacing
R = bend radius of curvature
LK = length of key of weir into bank

| | |
|---|---|
| W: | 100 feet |
| R: | 1400 feet |

### Weir Length (Projected into Flow)

Typically, W/10 < L < W/4
Maximum L = W/3

| | |
|---|---|
| Choose L: | 16 feet |

### Weir Spacing

Suggested S: S = 1.5L * (R/W)^0.8 * (L/W)^0.3

| | |
|---|---|
| Suggest. S: | 114 feet |

Maximum S: S = R * [1 - (1-L/R) ^ 2] ^ 0.5

| | |
|---|---|
| S(max): | 211 feet |

Note: Use of S(max) is not encouraged. It is most appropriate when R > 4W and some erosion between weirs can be tolerated.

| | |
|---|---|
| Choose S: | 120 feet |

### Length of Key

LK is typically about L/2 for short weirs, about L/5 for longer weirs.

| | |
|---|---|
| Define L: | Short |
| LK(~L): | 8 feet |

Minimum key length is 1.5 * (total bank height)
Actual or adjusted (reduced) bank height

| | |
|---|---|
| Bank Height | 14 feet |
| LK(min): | 21 feet |

Recommended length of key:
for R > 5W: LK = S * tan20 - L

| | |
|---|---|
| LK(1): | 28 feet |

for R < 5W: LK = L/2 * (W/L)^.3 * (S/R) ^ 0.5

| | |
|---|---|
| LK(2): | N/A feet |

### Top Width of Weir (for Stone Weirs):

Top width need not be > 2 * (maximum stone size)

Seed, Fertilize and Mulch –
After the soil is graded and prepared for planting, the consultant will then seed, fertilize and mulch the regraded streambank area with willow sticks and other vegetation to be determined later. Seeding will most likely be accomplished through hydroseeding or some other similar method. This will be determined after final design of the project. The upper portion of the bank will also be planted with trees and shrubs and then fertilized and mulched.

Plant Trees and Shrubs (Upper Bank)
Native trees and shrubs will be planted along the immediate upper bank area of the streambank to help stabilize the bank. The soil will be amended prior to this planting and sustained with fertilizer. When they are planted, the area will be mulched.

Weed Control –
Weed control typically occurs before, during and after construction. Existing weeds may be chemically treated prior to ground disturbance to minimize their post-construction impact. Constructions measures might be employed to minimize chemically treated for one to a few years after construction, depending on site conditions and the degree of weed colonization.

Below is MRI's estimate of costs for the recommended solution. Estimate Prepared by: Dale Miller, Certified Professional in Erosion and Sediment Control, (CPESC). See Appendix D for Mr. Miller's resume of work as well as a list of similar projects that he has been involved in within the last 5 years.

| Item # | Activity | Total Cost |
|---|---|---|
| 1.0 | **Design Application** | |
| 1.1 | Professional services | |
| 1.1.1 | *Geotechnical* | $4,374 |
| 1.1.2 | *Hydrologic and Hydraulic* | $4,624 |
| 1.1.3 | *Civil design* | $6,048 |
| 1.1.4 | *Plans* | $14,833 |
| 1.1.5 | *Specifications* | $8,504 |
| 1.1.6 | *Consultation Fees* | $2,874 |
| 1.2 | Survey/Topographic Base Map | $4,668 |
| **Subtotal** | | **$45,925** |
| 2.0 | **Site Preparation** | |
| 2.1 | *Erosion control* | $6,000 |
| 2.2 | *Grubbing, Topsoil Removal and Stockpiling* | $7,000 |
| 2.3 | *Removal of rocks in Channel and Concrete on Bank* | $9,000 |
| 2.4 | *Construction Dewatering* | $60,000 |
| 2.5 | *Haul Road Improvements* | $17,000 |
| **Subtotal** | | **$99,000** |
| 3.0 | **Bank Protection** | |
| 3.1 | Earthwork Associated with Partial berm Removal | $50,000 |
| 3.2 | Barb Protection | |

| | | |
|---|---|---|
| 3.2.1 | *Excavation for Toe* | $7,000 |
| 3.2.2 | *Excavation for Barb* | $9,000 |
| 3.2.3 | *Backfill as needed* | $3,000 |
| 3.2.4 | *Filter Placement* | $7,200 |
| 3.2.5 | *Rock placement* | $31,000 |
| 3.2.6 | *Willow Placement* | $4,000 |
| 3.3 | Upper Bank Protection | |
| 3.3.1 | *Erosion Control Fabric Placement* | $7,000 |
| 3.3.2 | *Revegetation* | $2,500 |
| 3.4 | Upstream and Downstream Transitions | $10,000 |
| **Subtotal** | | **$130,700** |
| | | |
| 4.0 | **Site Reclamation** | |
| 4.1 | *Grade and Landscape spoil materials* | $36,000 |
| 4.2 | *Seed, Fertilize and Mulch* | $4,000 |
| 4.3 | *Plant Tree and Shrubs (Upper Bank)* | $5,500 |
| 4.4 | *Weed Control* | $3,000 |
| **Subtotal** | | **$48,500** |
| | | |
| 5.0 | **Additional costs** | |
| 5.1 | *Mobilization, Bonding, Insurance* | $30,602 |
| 5.2 | *Construction Services* | $32,610 |
| 5.3 | *10% Contingency* | $38,214 |
| **Subtotal** | | **$101,426** |
| | | |
| **Total** | | **$425,551** |

**Riparian Corridor Restoration Plan**

When the bank stabilization and berm placement is complete, the HCPD will employ a contractor to plant approximately 3 acres of riparian area along the Whitewater River as shown in Exhibit 2 with native vegetation consisting of trees and shrubs appropriate to the existing plant cover. See Exhibit 3 for USGS map. Trees and shrubs will be planted 100' on center and total approximately 1,500 plants. This revegetation of the area will speed the natural tree growth of this area

Appropriate deer fencing and watering will be included in this contract to ensure the plants' survival.

| Item # | Activity/Material/Description | Costs |
|---|---|---|
| | | |
| 1.0 | Reforestation of trees and shrubs – 3 acres | $46,800 |
| 2.0 | Deer protection fencing | $ 6,000 |
| | | |
| **Total** | | **$52,800** |

## C. Project Emphasis

**OPEN SPACE**

**Woodland Habitat**

**__X__ 1. Reduces or eliminates nonnative, invasive species of plants or animals**

**__X__ 2. Preserves or increases high quality, viable habitat for plant or animal species, including native species.**

__X__ **3. Preserves or restores other natural features that contribute to quality of life and state's natural heritage.**

There is honeysuckle, musk thistle and other invasive species on either side of, and along, the bank area that will need to be removed during the bank stabilization project. This will be done to ensure that the area will develop as a native habitat and can establish itself to provide a more balanced environment for native wildlife.

This project will restore and improve two primary habitats along the Whitewater River: First, the stabilization of the bank area will reduce sedimentation into the river and provide filtration of flood water thus improving the aquatic habitat; and second will re-establish a 150' wide riparian corridor along the Whitewater River that is currently used as agriculture fields. See red outline on Exhibit 2. The creation of the aquatic and riparian forest habitats will improve the environment for numerous types of wildlife.

The Whitewater River and its native vegetation contribute to the quality of life of this region as well as being a part of our natural heritage. Numerous people use this river as a water trail enjoying canoeing and kayaking and the scenic beauty of the river. The stabilization and replanting of this area will improve the aesthetic quality of the river's edge and improve water quality within the stream thus improving its overall health.

<u>Aquatic Habitat</u>

__X__ **4.Incorporates aesthetically pleasing and ecologically informed design including sensitivity to the terrain, natural resources and heritage of the property.**

The HCPD will ensure that this project is designed and implemented in an environmentally sound way that is ecologically informed and sensitive to the river environment and natural resources of the area. MRI is a respected professional firm in the field of stream restoration and has a proven record with the HCPD in streamside restoration. Best practice measures will be utilized to control sediment loading in the river.

__X__ **7.Supports openspace/greenspace planning and preserves lands as recommended within previously identified planning or natural resources management documents.**

This bank stabilization and riparian planting project is consistent with and helps to implement a number of important community and local environmental plans and policies adopted by county organizations regarding environmental sensitivity to natural features. Two more notable plans are the Hamilton County Planning Commission's Community Compass Plan and the Western Hamilton County Collaborative Plan. These plans are explained in more detail on page 11.

__X__ **8.Provides access to natural areas that result in recreational, economic or aesthetic preservation benefits.**

The HCPD is actively pursuing purchase of land between Shawnee Lookout and Miami Whitewater Forest for the proposed bike/hike trail and plans to continue to do so until a corridor is secured. A portion of this trail will travel through the Kilby

Road site and by the bank stabilization area. The stability of the banks along the Whitewater River will be essential to providing a secure base for a future bike/hike trail.

**RIPARIAN CORRIDOR**

__X__ **12. preserves or restores functioning floodplains, including groundwater recharge areas.**
__X__ **13. preserves or restores water quality and/or aquatic biological communities.**
__X__ **14. preserves or restores natural stream channels.**
__X__ **15. preserves or restores streamside forest, native vegetation or adjacent habitat.**
__X__ **18. plants vegetation or reforests lands for filtration to improve water quality, or to control stormwater runoff.**

The two enhancements taking place in this application; the bank stabilization/ planting and the reforestation of the streamside forest will produce multiple environmental benefits. Restoring the vegetation and stabilizing the bank will improve the site's ability to trap water to restore the sites groundwater reserves, restore water quality, preserve the stream channel, restore streamside forest, aid in filtration on the site as well as control stormwater runoff.

Sedimentation from the eroded bank will be minimized by the native planting that will occur at the site. Water quality will directly benefit from this improvement and will enhance the aquatic habitat for the many species, some state endangered, in the Whitewater River.

The Whitewater River floodplain contains a rich habitat for wildlife as well as providing a healthy riparian corridor along much of the Kilby Road riverfront property. The proposed native plantings on the streambank and riparian corridor restoration area will enhance and protect the natural stream channel by providing strength and nutrients to the soil. This revegetation will aid in providing an environment which can create protection for aquatic habitat which will stimulate the aquatic food chain.

The eroded streambank will undergo extensive planting and bio-engineering to stabilize the bank. The added vegetation will increase the viability of this habitat as well as help filtrate water on the site during normal flow and flood events to trap and break down non-point source pollutants.

This vegetation restoration along the bank streamside and along the larger streamside forest will also create needed plant material to help filtrate floodwaters, prevent excessive stormwater runoff into the river, and aid in trapping water to aid in groundwater recharge.

**D. Define Terms of Easement** This application does not entail acquisition of land or easements with funds from the Clean Ohio Fund. The restoration/bank stabilization and riparian corridor replanting work occurs on park property which

was purchased in 2001. The HCPD agrees to preserve a 150 foot wide riparian buffer along the southern portion of the property, as shown in Exhibit 2. This will aid in the preservation and integrity of the riparian corridor and river. There is an area directly adjacent to the slope failure that will be replanted to a width of approximately 150'.

**E. Extent of public access once project is completed.**

The site is currently available to the public from dawn to dusk. The HCPD does request that visitors call before visiting the site to ensure their safety as it is considered a natural area and is not frequented often by the public.

The site can be accessed via Kilby Road. The majority of the site is in a natural state with riparian corridor with some farm fields that are currently being managed by the HCPD.

## 2.2 Ownership/Management/Operation

Ownership/Management

The HCPD purchased the Kilby Road Property in 2001 and will continue to manage the property in compliance with HCPD land management practices.

Maintenance/Operations

The Kilby Road property has been maintained and operated by the HCPD since its purchase in 2001. The bank stabilization project, when completed, will be monitored as needed to assess the slope's status to ensure the long term success of this repair. If, upon inspection, the slope needs additional repairs to stabilize the bank, the HCPD will take the necessary actions needed to restore the slope.

The Kilby Road site has been maintained and operated since its purchase by the HCPD according to their standard land management and operational practices. The HCPD is an experienced and successful steward of land and is currently responsible for successfully maintaining and operating 15,538 acres of parkland, 80% of which is in a natural state.

Similar Experience

The HCPD implemented another slope stabilization at Lake Isabella which was on a much larger scale than the proposed Kilby Road site. In the early 1990's, a 34' foot high earthen bank was eroding which was compromising its strength. If this bank failed, eventually the river and lake would have merged permanently flooding the entire park area. Bioengineering methods were successfully used to stabilize the riverbank.

Below are some examples of previous bank stabilization projects which have been completed by the HCPD in recent years.

**Previous bank stabilization and erosion control projects –**

- Lake Isabella Riverbank Stabilization project. The Park District used bio-engineering techniques to successfully stabilize the bank separating the Little Miami River and Lake Isabella. The Park District hired Mainstream

Restoration Inc. to develop a bio-engineering plan that would stabilize the 34' foot high earthen barrier separating the Little Miami River and Lake Isabella. The project was completed by the Park District in 2000 and is continuing to work as expected, securing the bank. The stabilization has proven to be very successful at this site and is preventing erosion on the slope. See before and after photos of this project in Exhibit 5.

The Park District received an Environmental Award for this project from the National Association of County Parks and Recreation Officials (NACPRO) following completion of the major work.

- Howard Creek Bank Stabilization– The HCPD performed two in-house streambank stabilization projects along Howard Creek four years ago, which have established themselves and are successful. Two areas along the creek were failing. The first site measured approximately 30' high by 100' long and the second was approximately 20' high by 100' long. The Park District utilized staff to install willow stakes into the bank and plant prairie plants and seeds to stabilize them further. In addition to this work, HCPD established a small wetland environment and introduced species such as spotted salamander and other wetland amphibians. These species have established themselves and their populations are growing. The two bank areas are proving to be successful.

**2.3** **Purchase Contract:** There is no property purchase associated with this project.

## Part III. Compliance with State Criteria

1. Percentage of Clean Ohio matching funds necessary to complete project

_____ 75% ___X___ 74 - 70% _____ 69 - 65% _____ 64 - 60% _____ <60%

The HCPD is requesting 74% of Clean Ohio Funding for the 2005 Funding year.

2. Level of collaborative participation: Participation means active involvement through in-kind services or funding.

_____ local political subdivisions _____ State agencies _____ federal agencies

_____ community organizations _____ conservation organizations

_____local business groups

3. OPWC Districts

_____ Joint project in more than one district

_____ Joint project in this district

_____Carries out an adopted community, watershed or other plan overlapping another district

4. Community benefits: Relative economic, social and recreational benefits

__X__ economic benefits __X__ social/recreational

Economic Benefits

Numerous plans in the county encourage the preservation and restoration of riparian corridors. By adding vegetation, especially native, it improves many quality of life and infrastructure elements within a community. Greenspace will reduce storm water management costs and water quality management cost by increased absorption of runoff. The presence of preserved trees on site also creates a process called transpiration which helps to purify air quality in Hamilton County, which currently is in noncompliance with the Environmental Protection Agency. This process would help reduce air quality related health costs, such as treatment for lung cancer, asthma and other respiratory diseases.

Social/Recreational Benefits
The Whitewater River is already an active recreational river, used by canoeist and kayakers. Part of this river experience is being able to view natural areas which will be enhanced by this project. The Park District is considering placing a bike/hike trail on the site which will connect Shawnee Lookout to Miami Whitewater Forest.

The restoration of this area will not only stabilize the bank area, improve water quality, and preserve the aquatic community, but will provide a more scenic view of the river environment for the user.

Points 5 – 7 are addressed previously in this application. See Above.

## Part IV. Compliance with Hamilton County Priorities

**1. Community Planning –**

The Community Compass/Hamilton County 2030 plan and implementation framework, Greenspace Concept Plan states the importance of preserving our natural greenspace resources. The greenspace concept has evolved from the identification of environmental critical and sensitive areas, such as aquifers and steep slopes, existing public and private open space and other natural features such as rivers, streams and lakes. The Greenspace Concept map utilizes the work and recommendations of various organizations including the recent Hamilton County Regional Planning Commission State of the County Report on environmental as well as the nine county regional greenprint prepared by Green Umbrella, and extensive geographic and environmental analysis completed by the Hamilton County Park District, environmental policies recommended by OKI Land Use Commission's Regional Strategic

Policy Plan and the aligned policies related to environment in the Hamilton County Policy Plan. The Whitewater Riparian Corridor is identified on the Greenspace Concept Plan Map as an environment to preserve. See Appendix C.

The HCPD's priority to preserve greenspaces in this county is further reflected in the Hamilton County Planning Commission's Community Compass Report No. 16-6 "State of the County Report: Environment. It states that "Whereas past conservation efforts often focused on protecting individual pieces of land, emphasis is now being placed on the need to provide for green infrastructure. Green infrastructure provides a framework for creating an interconnected network of natural streams, conservation lands, working landscapes and other green spaces that support native species, maintain natural ecological processes, sustain air and water resources, and contribute to the health and quality of life for American's communities and people".

This acquisition will also comply with the EPA mandated and approved **Storm Water Management Program** prepared by HCPD.

In March 2003, HCPD completed this mandated program to outline HCPD stewardship practices utilized on all existing and newly acquired greenspaces. This program was approved by the OEPA in 2003 and presented the Park District with a five-year permit giving approval for projects occurring during that time. In return, the HCPD is required by law to implement all stewardship and development guidelines as set forth in HCPD's Storm Water Management Program to ensure the greenspaces are managed per the OEPA's standards.

This program outlines some major components that are a part of HCPD stewardship practices. They include: preserving open space; performing environmental assessments on potential acquisitions, reducing impervious surfaces on the site, and reforesting these lands.

2. **Natural Resource Viability: How important is the project to the viability of the natural resources affected by the project.**

***Protects 1-5 State Natural heritage Inventory (NHI) ranked rare species***
It was determined by the Ohio Environmental Protection Agency (OEPA) in 1995 that one (1) State Special Interest fish species, Mooneye, was identified in the portion of the Whitewater River that flows by the Kilby Road property. A complete listing of the fish species found in the OEPA study in this area of the river are listed in Appendix A. When this slope failure is repaired, water quality will be prepared and added aquatic habitat will have the opportunity to establish itself due to the secured soil.

It was determined by the Ohio Environmental Protection Agency (OEPA) in 1995 that one State Endangered fish species, Northern madtom, Noturus stigmosus was located in the Whitewater River approximately one mile north of the confluence of the Great Miami and Whitewater Rivers. The health of the entire river influences the survival of its aquatic habitat. This fish most likely is located

in the stretch of river passing by the Kilby Road site. A complete listing of the fish species found in the OEPA study is listed in Appendix A.

**Protects a threatened biological community or important example of Ohio's natural heritage.**

The Ohio Environmental Protection Agency (OEPA) report in 1995 "Biological and Water Quality Study of Middle and Lower Great Miami River and selected Tributaries" rates the Whitewater River as an Exceptional Warmwater Habitat (3745-1-21 table 21-1 OAC). This is the highest designation in our region equaled only by the Little Miami River above Beechmont and the Dry Fork of the Whitewater north of Atherton Rd. This designation is based on an actual biological field assessment performed by the OEPA. It is also listed by OEPA as having "Superior quality waters" (3745-1-05 table 5-4 OAC) the only stream so designated in Hamilton County. See Appendix B – Biological Attainment Map.

The OEPA defines an Exceptional Warmwater Habitat as a designation reserved for waters which support "unusual and exceptional" assemblages of aquatic organisms which are characterized by a high diversity of species, particularly those which are highly intolerant and/or rare, threatened, endangered, or special status (i.e. declining species); this designation represents a protection goal for water resource management efforts dealing with Ohio's best water resources.

The study also determined that this stretch of river contains an impressive 47 species of fish which is considered exceptional and indicates the river's rich aquatic community. The study rated the stretch of river along these properties as having an exceptional biological community performance.

3. **Project preserves or naturally restores steep hillsides with slopes greater than 20%:**

   The eroded area along the river shore far exceeds a 20% slope. After the most recent erosion damage, the 20 foot high bank is nearly vertical and very vulnerable to erosion, see photo page, Exhibit 5. The Streambank Stabilization report prepared by MRI stated that much of this bank contains fill material making it even more susceptible to erosion.

4. **Preserves or enhances undeveloped lands along viewsheds of major highway**

   This property is visible from I-275. The preservation of this property will add to the aesthetic quality of the viewshed along this corridor.

5. **Protection of highly erodable lands:**

   Soil maps show that the bank area lies within the St, Stonelick, soil classification which is generally flat with well drained soil. Flooding can occur in these areas at any time of the year, but the St classification generally experiences flooding in the spring, fall and winter months. All of these flood events are generally brief in nature and streamside trees can withstand them.

Permeability is moderately rapid and water capacity is low. Runoff is slow. The Soil Survey notes that in some areas of this soil type, where the land slopes into the river, measures such as the use of plant cover or other engineering processes is needed to reduce streambank erosion. Regular addition of organic matter will help conserve moisture in the soil and maintain the fertility of the soil. This soil type does experience streambank erosion if proper measures are not taken, such as planting vegetation or utilizing bio-engineering practices, as in the case of this project. See Exhibit 4 for Soil Survey Map.

MRI's preliminary study of the site concluded that the majority of the bank consists of deep loamy soils. There is evidence, eg. protruding logs, indicating that portions of the bank consist of fill material resulting from the former gravel mining operations. However, the material at the toe of the slope (1-2 feet above the observed water surface elevation consists of a resistant clay layer, which has likely served to slow the rate of erosion somewhat. Rapidly fluctuating river levels likely contribute to bank instability as rapid drawdown leaves saturated soils susceptible to mass failure. The consultant's preliminary report recommends hiring a geotechnical professional to evaluate the soil conditions on the site to more completely determine the appropriate direction to take.

A riparian corridor is established along a large portion of the streambank on this property, but the area adjacent to the embankment described in this application has lost its riparian vegetation due to farming. By restoring the vegetation along this area of corridor, it will help to stabilize the slope on the upper area of the river's edge. The addition of plants on the bank area will also notably control future slippage of this area.

**Readiness to proceed:** The HCPD has a preliminary bank stabilization plan which was prepared by MRI in May of 2004. The Park District is in a position to begin work on detailed engineering plans and stabilization of the bank upon approval of a contract with Ohio Public Works Commission.

## 3.0 PROJECT SCHEDULE:*

| | | BEGIN DATE | END DATE |
|---|---|---|---|
| 3.1 | Planning and Implementation: | 11/29/05 | 4/29/06 |
| 3.2 | Land Acquisition/Easements: | / / | / / |
| 3.3 | Site Improvements: | 4/29/06 | 5/10/07 |

* Failure to meet project schedule may result in termination of agreement for approved projects. Modification of dates must be requested in writing by a project official of record and approved by the commission once the Project Agreement has been executed.

## 4.0 PROJECT OFFICIALS:

| | | |
|---|---|---|
| 4.1 | CHIEF EXECUTIVE OFFICER | Jack Sutton |
| | TITLE | Director |
| | STREET | 10245 Winton Road |
| | CITY/ZIP | Cincinnati, OH 45231 |
| | PHONE | (513) 521-7275 |
| | FAX | (513) 521-2606 |
| | E-MAIL | jsutton@greatparks.org |
| 4.2 | CHIEF FINANCIAL OFFICER | Jack Herbert |
| | TITLE | Treasurer |
| | STREET | 10245 Winton Road |
| | CITY/ZIP | Cincinnati, OH 45231 |
| | PHONE | (513) 521-7275 |
| | FAX | (513) 521-2606 |
| | E-MAIL | jherbert@greatparks.org |
| 4.3 | PROJECT MANAGER | Ross Hamre |
| | TITLE | Planning Director |
| | STREET | 10245 Winton Road |
| | CITY/ZIP | Cincinnati, OH 45231 |
| | PHONE | (513) 728-3551, ext. 256 |
| | FAX | (513) 521-2896 |
| | E-MAIL | rhamre@greatparks.org |

Changes in Project Officials must be submitted in writing from the CEO or CFO.

## 5.0 ATTACHMENTS/COMPLETENESS REVIEW:

In order that your application may be processed in a timely fashion, please submit your application on 8 ½ by 11 white paper with dark ink so that it may be copied for others. It is understood that some items may not conform to this request such as large maps and photographs. Please feel free to include these items.

Confirm in the blocks [ ] below that each item listed is attached.

[ X ] A certified copy of the authorization by the governing body of the applicant authorizing a designated official to sign and submit this application and execute contracts. This individual should sign under 6.0, Applicant Certification, below.

[ X ] A certification signed by the applicant's chief financial officer stating all local share funds required for the project will be available on or before the dates listed in the Project Schedule section.

[ X ] A formal detailed estimate of the project's costs provided by an architect, landscape architect, or other professional. For land acquisition, an appraisal by a State-certified general real estate appraiser, as defined under ORC 4763 for the type of land being appraised will need to be submitted to the NRAC prior to closing.

[ ] A cooperation agreement (if the project involves more than one entity) which identifies the fiscal and administrative responsibilities of each participant.

[ ] Resolution of Support (Please refer to section 164.23(B)(1) of the Ohio Revised Code for guidance.)

[ X ] Identification of any participation by state agencies that will provide to this particular project and that will provide assistance with respect to the project.

[ ] Information concerning the coordination of the project among local political subdivisions, state agencies, federal agencies, community organizations, conservation organizations, and local business groups.

[ X ] Supporting Documentation: Materials such as additional project description, photographs, and/or other information to assist your NRAC in ranking your project. Be sure to include supplements which may be required by your *local* NRAC.

[ X ] Have you reviewed your NRAC's methodology to see that you have addressed all components?

### 6.0 APPLICANT CERTIFICATION:

The undersigned certifies: (1) he/she is legally authorized to request and accept financial assistance from the Ohio Public Works Commission; (2) to the best of his/her knowledge and belief, all representations that are part of this application are true and correct; (3) all official documents and commitments of the applicant that are part of this application have been duly authorized by the governing body of the applicant; and, (4) should the requested financial assistance be provided, that in the execution of this project, the applicant will comply with all assurances required by Ohio Law, including those involving Buy Ohio and prevailing wages.

**Applicant certifies that the project, as defined in the application, has NOT resulted in any transfer of title or rights to land or begun any type of physical improvements prior to the execution of a Project Agreement with the Ohio Public Works Commission. Action to the contrary will result in termination of the agreement and withdrawal of Ohio Public Works Commission funding.**

JACK SUTTON, Director

Jack Sutton 7/29/05

Original Signature/Date Signed

# ATTACHMENT A

**PROJECT EMPHASIS (Whitewater River Bank Stabilization Project)**
NOTE: IF THE PROJECT HAS MORE THAN ONE EMPHASIS, PLEASE PLACE A "1" IN THE CATEGORY THAT IS THE PRIMARY EMPHASIS, A "2" IN THE CATEGORY WITH SECONDARY EMPHASIS, AND A "3" IN THE CATEGORY WITH THIRD EMPHASIS.

OPEN SPACE

__*__ 1. Protects habitat for rare, threatened and endangered species
__*_ 2. Increases habitat protection
__*__ 3. Reduces or eliminates nonnative, invasive species of plants or animals
__*_ 4. Preserves high quality, viable habitat for plant and animal species
__*__ 5. Restores and preserves aquatic biological communities
____ 6. Preserves headwater streams
__2__7. Preserves or restores flood plain and stream side forest functions
__3__8. Preserves or restores water quality
__1__9. Preserves or restores natural stream channels
__*__10. Preserves or restores functioning flood plains
____11. Preserves or restores wetlands
__4_ 12. Preserves or restores stream side forests
__*__13.Preserves or restores other natural features that contribute to quality of life and state's natural heritage

RIPARIAN CORRIDOR

____14. Fee simple acquisition of lands to provide access to riparian corridors or watersheds.
____15. Acquisition of easements for protecting and enhancing riparian corridors or watersheds
__*_16. Reforestation of land
__*_17. Planting vegetation for filtration
__*__18. Incorporates aesthetically pleasing and ecologically informed design
____19. Enhances educational opportunities and provides physical links to schools and after school centers
____20. Acquisition of connecting corridors
__*_ 21. Supports comprehensive open space planning
____22. Provides multiple recreational, economic and aesthetic preservation benefits
____23. Allows proper management of areas where safe hunting and trapping may take place in a manner that will preserve balanced natural ecosystems.
____ 24. Enhances economic development that relies on recreational and ecotourism in areas of relatively high unemployment and lower incomes

One (1) through three (3) indicate the project's primary components. Asterisks (*) indicate strong elements involved within this project.

**BOARD OF PARK COMMISSIONERS**
**HAMILTON COUNTY PARK DISTRICT**

July 19, 2005

RESOLUTION NO. 2532

**CLEAN OHIO CONSERVATION PROGRAM**

WHEREAS, the Board of Park Commissioners of the Hamilton County Park District, desires financial assistance under the Clean Ohio Conservation Program Funds, administered by the Ohio Public Works Commission.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Park Commissioners of the Hamilton County Park District, as follows:

1. That the Board of Park Commissioners of the Hamilton County Park District hereby approves filing of applications for the Clean Ohio Conservation Program Funds.

2. That Jack Sutton, Director, is hereby authorized and directed to execute and file applications with the Ohio Public Works Commission, to enter into any agreements as may be appropriate and necessary for obtaining this financial assistance, and to provide all information and documentation required in said application for submission to the Ohio Public Works Commission.

3. THAT THE BOARD OF PARK COMMISSIONERS OF THE HAMILTON COUNTY PARK DISTRICT hereby does agree to obligate the funds required to satisfactorily complete the proposed projects and thus become eligible for Clean Ohio Conservation Program financial aid up to 75% of the total project costs.

BOARD OF PARK COMMISSIONERS
HAMILTON COUNTY PARK DISTRICT

JAMES E. BUSHMAN, President

ROBERT A. GOERING, SR., Vice President

NANCY R. HAMANT, Vice President

ATTEST:

This 19th day of July, 2005

JACK SUTTON, Director

## CHIEF FINANCIAL OFFICER'S CERTIFICATION OF LOCAL FUNDS

July 29, 2005

I, Jack Herbert, Treasurer of the Hamilton County Park District, hereby certify that Hamilton County Park District has the amount of $124,371 in the Land Acquisition Fund and that this amount will be used to pay the applicant revenues for the Whitewater River Bank Stability project.

Jack Herbert

Jack Herbert, Treasurer

# Consultation with Legislative Authorities Per PRC 164.23

HAMILTON COUNTY PARK DISTRICT
10245 Winton Road, Cincinnati, Ohio 45231

FACSIMILE COVER SHEET
TEL NO. (513) 728-3551 Ext.217
FAX NO. (513) 521-2896

| | | | |
|---|---|---|---|
| DATE: | July 20, 2005 | FAX NO. | 367-6622 |
| TO: | Whitewater Township | PAGES: | 7 |
| ATTN: | **Tim McDonald** | | (including this cover sheet) |
| FROM: | **Sally Bauer, Park Planner** | | |

**IF YOU HAVE ANY PROBLEM WITH THE RECEPTION OF THESE PAGES, PLEASE CONTACT US AT (513) 728-3551, EXT 264**

As required by the Clean Ohio Conservation Program Grant Application, Ohio Revised Code Sec. 164.23, the Hamilton County Park District is consulting with Whitewater Township regarding the following project:

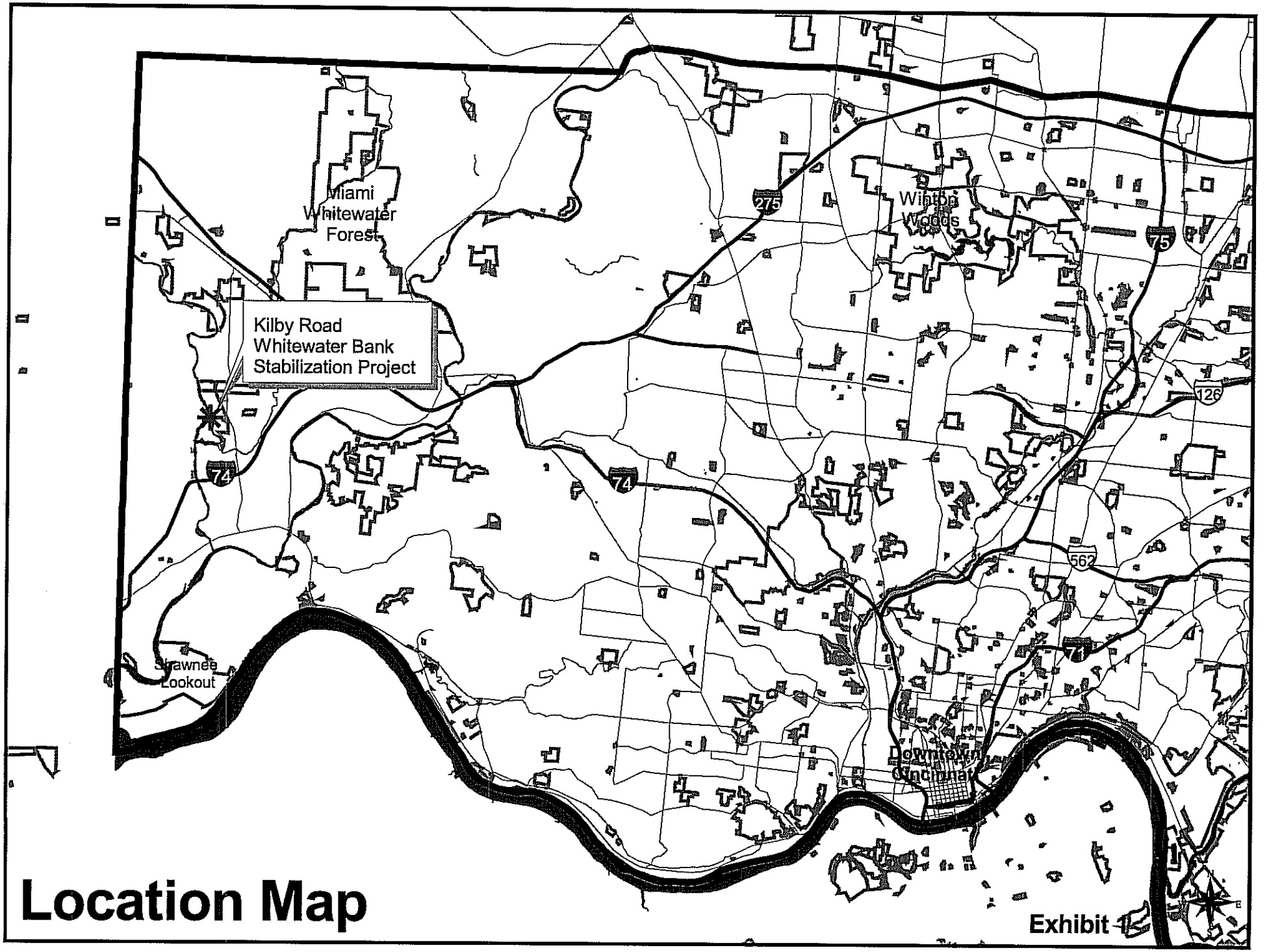
- Whitewater Bank Stabilization –see enclosed description and location of this bank stabilization project.

(See attached project information describing the above project)
No Funds from Whitewater Township are involved in this project.

**Please respond to this fax indicating you have received this information and acknowledge these applications.**

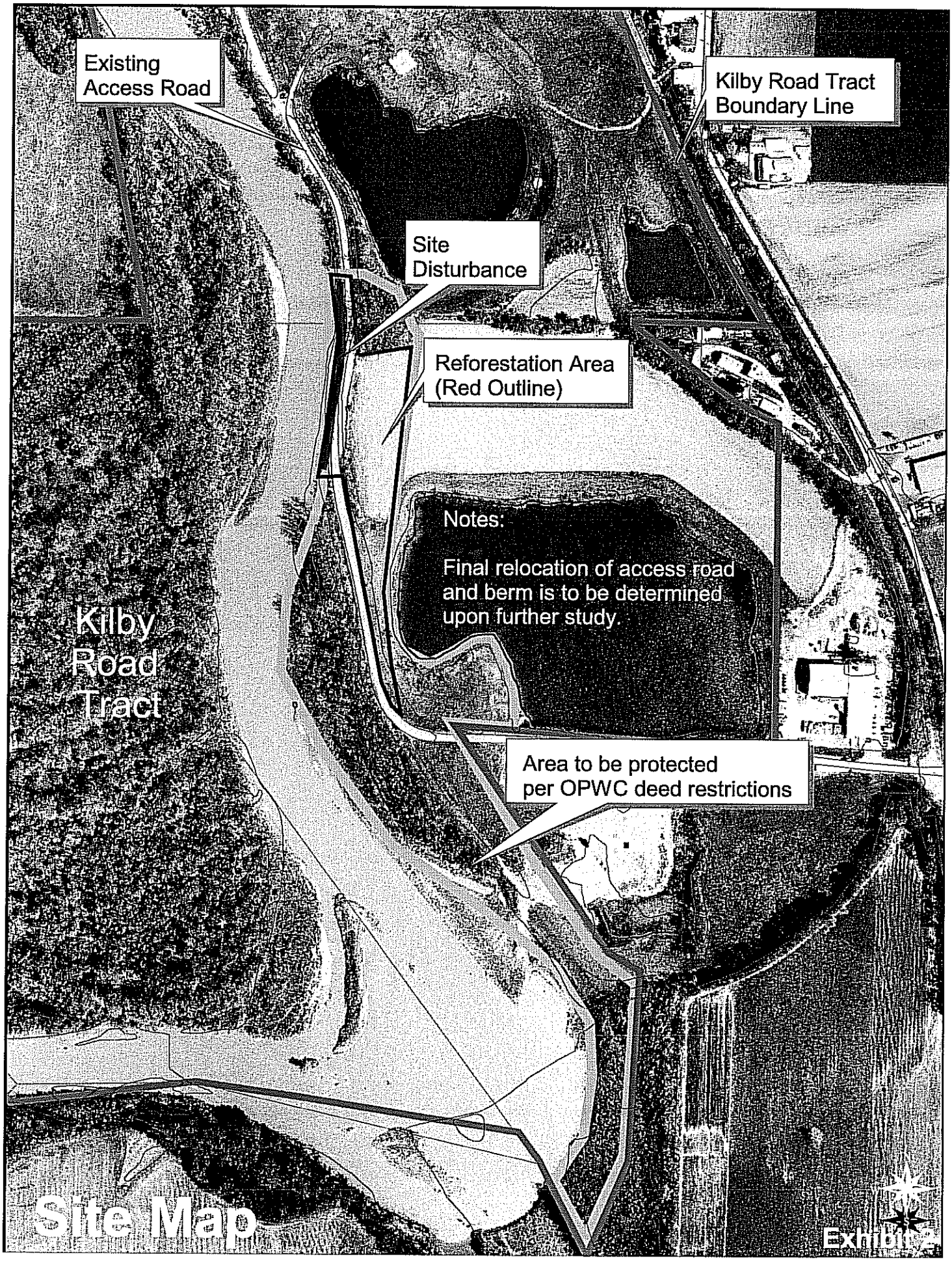
Should you have any questions, please contact Sally Bauer, Park Planner at 728-3551 extension 264.

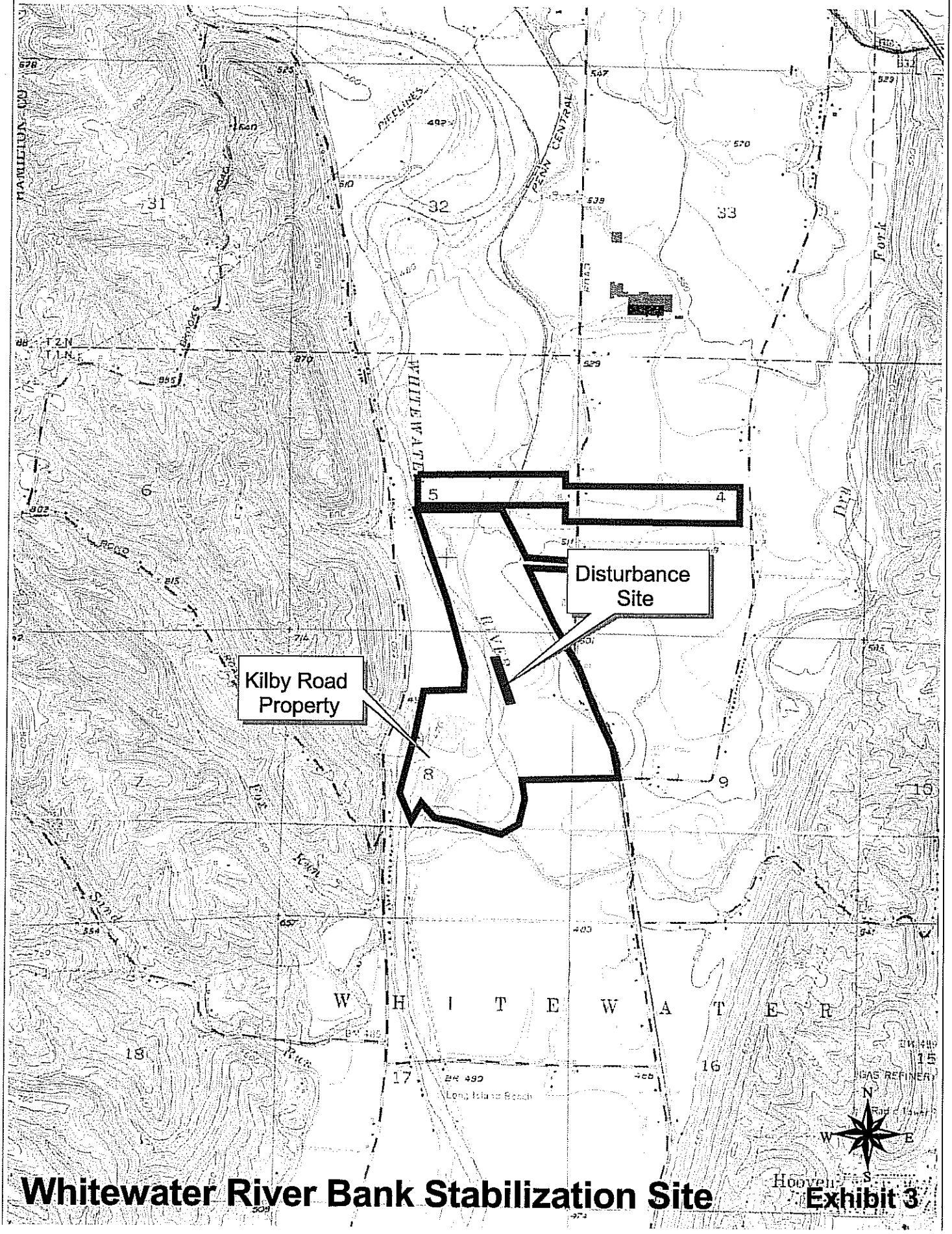
# Exhibits



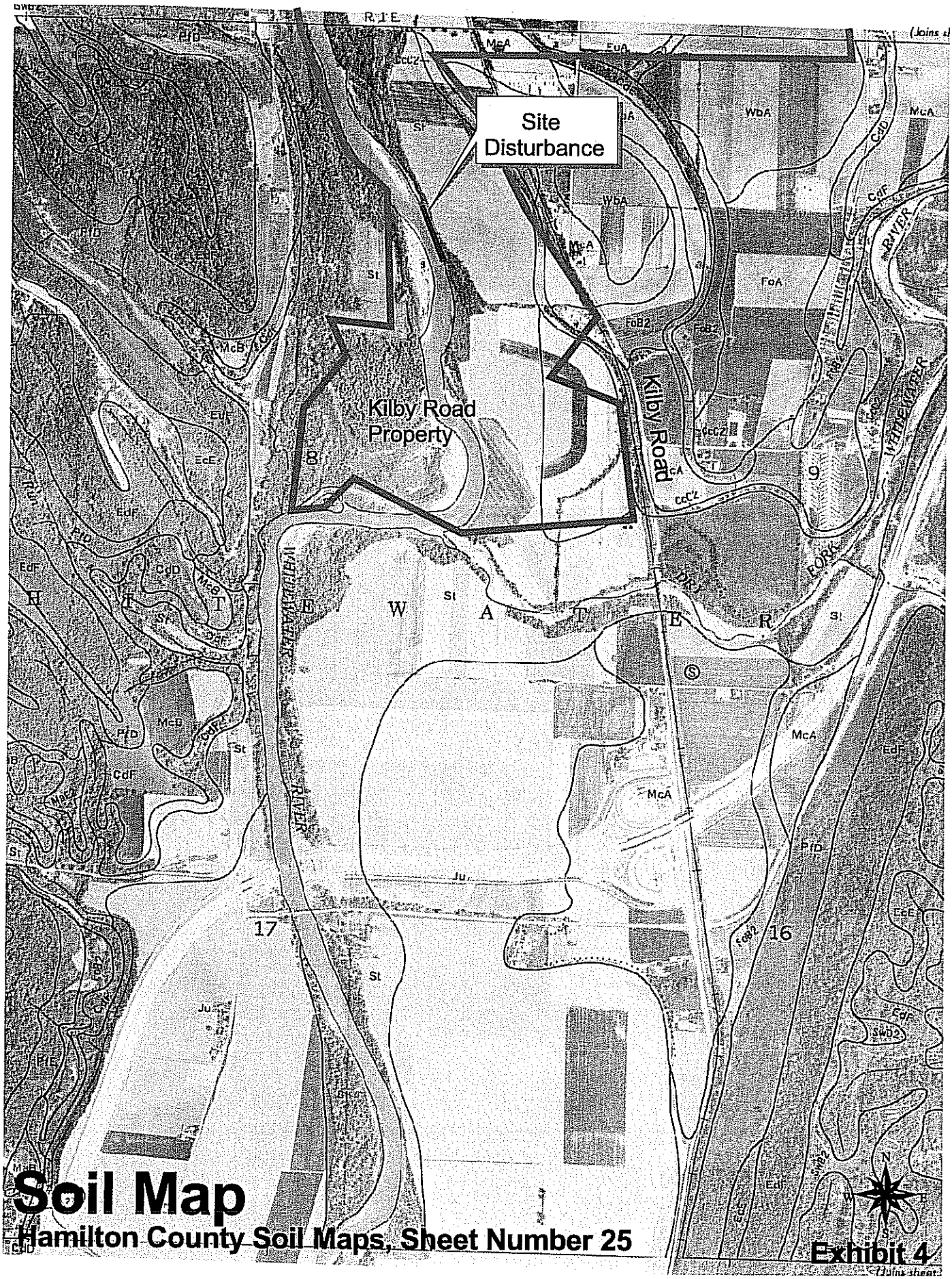

# Location Map

Exhibit 1


Existing Access Road
Kilby Road Tract Boundary Line
Site Disturbance
Reforestation Area (Red Outline)
Notes:
Final relocation of access road and berm is to be determined upon further study.
Kilby Road Tract
Area to be protected per OPWC deed restrictions
Site Map
Exhibit



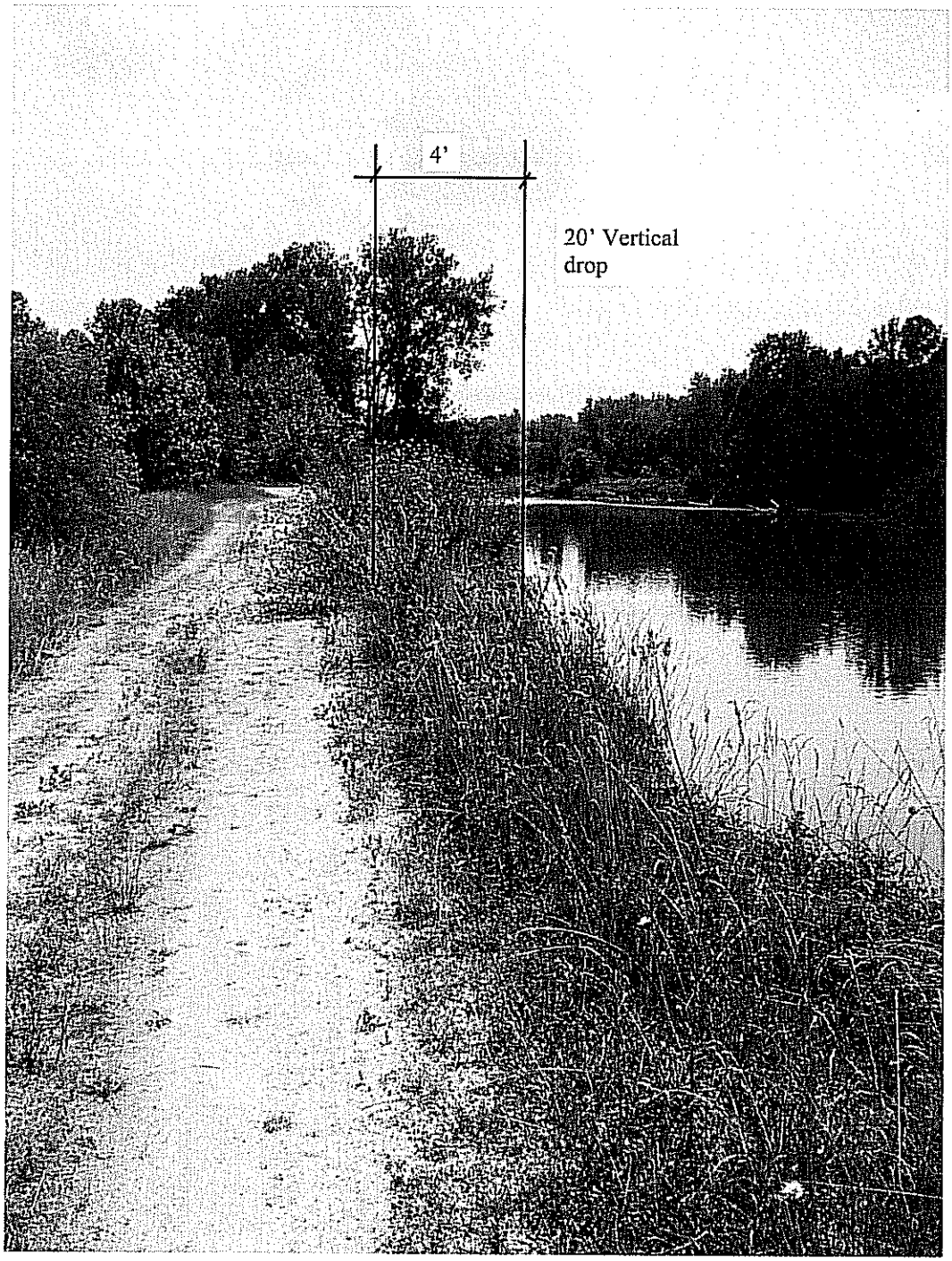

**Whitewater River Bank Stabilization Site** **Exhibit 3**




# Soil Map

## Hamilton County Soil Maps, Sheet Number 25

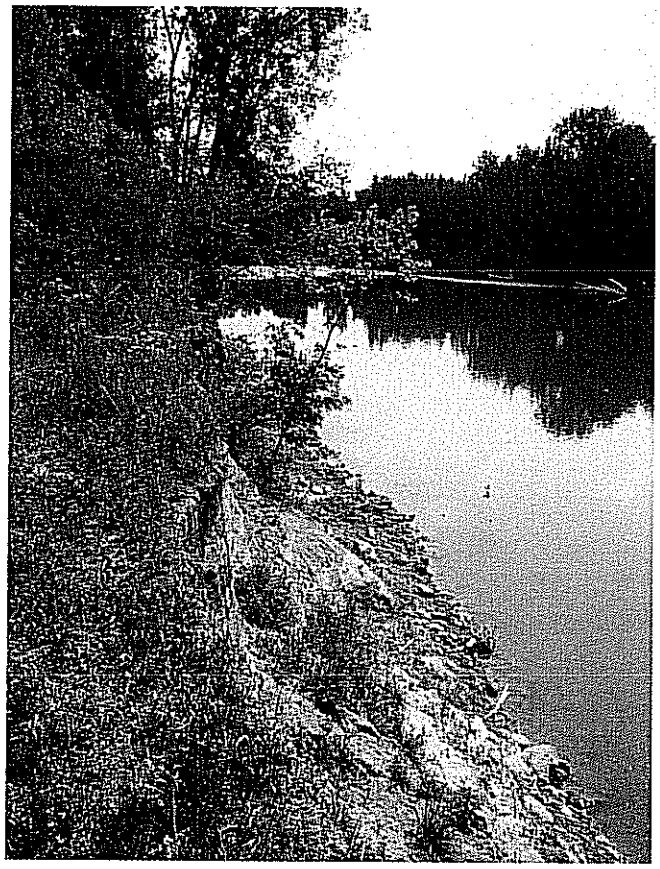
**Exhibit 4**



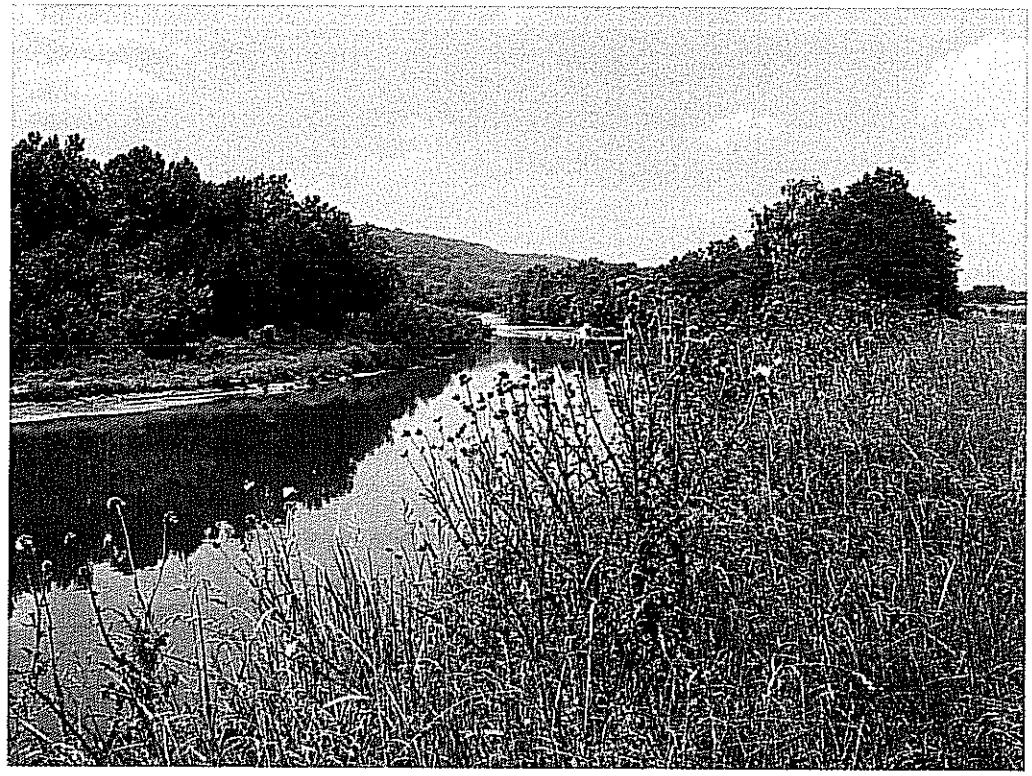

The existing access road is in danger of collapsing into the Whitewater River. As further erosion occurs. This road will be relocated to the east when the streambank stabilization is completed.

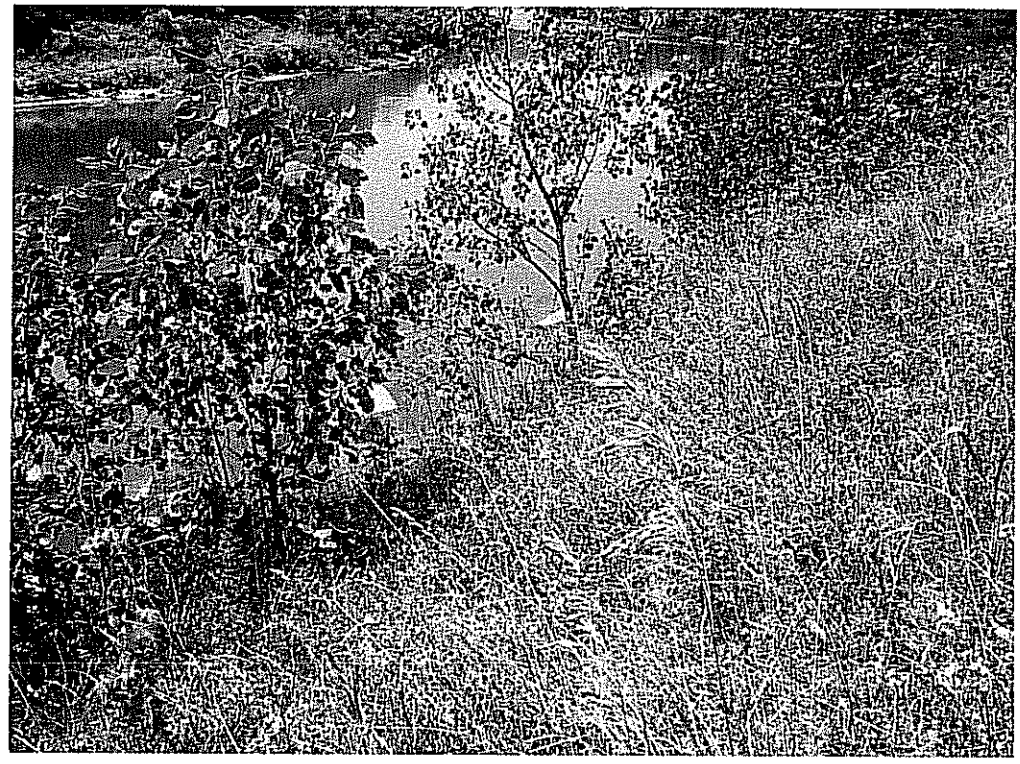
**Exhibit 5**

View of the disturbed bank in 2004 looking from the Whitewater River.



Picture taken in July of 2005 of the disturbed streambank.





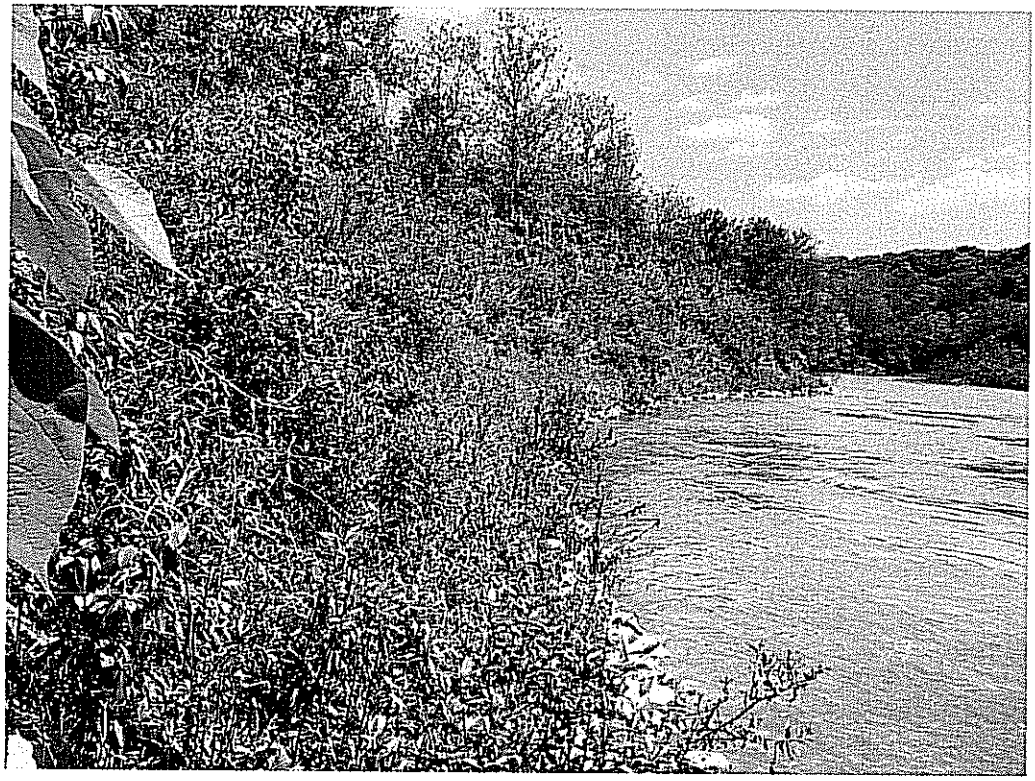
Invasive plants such as honeysuckle and musk thistle are present on the site and will be removed as a part of this application.

The cornfields shown above, which are approximately 80' from the river's edge, abut the existing service road. The HCPD plans to revegetate this area with a 150' riparian buffer which will reconnect the existing greenway along the Whitewater River.

# Lake Isabella Riverbank Stabilization Project – Before

Picture taken in 1995 shows the bank failure along the Little Miami Scenic River at Lake Isabella. Mainstream Restoration Inc. served as the consultant for this engineering project.

# Lake Isabella Riverbank Stabilization Project – After



This picture was taken in 2003, three years after final completion of the bank stabilization project along the Little Miami Scenic River at Lake Isabella. The bank is holding up well and continues to thrive.

# Appendix A - D

# Appendix A

## Species List

| River Code: **14-300** | Stream: **Whitewater River** | Sample Date: **1995** |
|---|---|---|
| River Mile: **0.80** | Basin: Great Miami River | Date Range: 10/04/95 |
| | Time Fished: 3178 sec Drain Area: 1483.0 sq mi | |
| | Dist Fished: 0.50 km No of Passes: 1 | Sampler Type: A |

| Species Name / ODNR status | IBI Grp | Feed Guild | Breed Guild | Tol | # of Fish | Relative Number | % by Number | Relative Weight | % by Weight | Ave(gm) Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| MOONEYE [S] | | I | M | R | 1 | 2.00 | 0.23 | 0.38 | 0.12 | 190.00 |
| GIZZARD SHAD | | O | M | | 41 | 82.00 | 9.60 | 9.07 | 2.91 | 110.63 |
| SMALLMOUTH BUFFALO | C | I | M | | 1 | 2.00 | 0.23 | 0.69 | 0.22 | 344.00 |
| QUILLBACK CARPSUCKER | C | O | M | | 1 | 2.00 | 0.23 | 1.14 | 0.37 | 572.00 |
| RIVER CARPSUCKER | C | O | M | | 1 | 2.00 | 0.23 | 1.90 | 0.61 | 950.00 |
| HIGHFIN CARPSUCKER | C | O | M | | 1 | 2.00 | 0.23 | 0.10 | 0.03 | 50.00 |
| SILVER REDHORSE | R | I | S | M | 6 | 12.00 | 1.41 | 3.40 | 1.09 | 283.33 |
| BLACK REDHORSE | R | I | S | I | 34 | 68.00 | 7.96 | 31.78 | 10.19 | 467.39 |
| GOLDEN REDHORSE | R | I | S | M | 99 | 198.00 | 23.19 | 74.98 | 24.03 | 378.69 |
| SHORTHEAD REDHORSE | R | I | S | M | 13 | 26.00 | 3.04 | 12.20 | 3.91 | 469.23 |
| NORTHERN HOG SUCKER | R | I | S | M | 56 | 112.00 | 13.11 | 18.39 | 5.89 | 164.15 |
| COMMON CARP | G | O | M | T | 28 | 56.00 | 6.56 | 112.96 | 36.20 | 2,017.11 |
| GRAVEL CHUB | N | I | S | M | 19 | 38.00 | 4.45 | 0.21 | 0.07 | 5.58 |
| SUCKERMOUTH MINNOW | N | I | S | | 15 | 30.00 | 3.51 | 0.22 | 0.07 | 7.27 |
| EMERALD SHINER | N | I | S | | 13 | 26.00 | 3.04 | 0.11 | 0.03 | 4.08 |
| BULLHEAD MINNOW | N | O | C | | 2 | 4.00 | 0.47 | 0.01 | 0.00 | 3.00 |
| CENTRAL STONEROLLER | N | H | N | | 16 | 32.00 | 3.75 | 0.19 | 0.06 | 5.88 |
| CHANNEL CATFISH | F | | C | | 19 | 38.00 | 4.45 | 30.35 | 9.73 | 798.68 |
| NORTHERN MADTOM [E] | | I | C | R | 1 | 2.00 | 0.23 | 0.00 | 0.00 | 2.00 |
| WHITE BASS | F | P | M | | 3 | 6.00 | 0.70 | 0.45 | 0.14 | 75.33 |
| WHITE CRAPPIE | S | I | C | | 6 | 12.00 | 1.41 | 0.81 | 0.26 | 67.67 |
| SMALLMOUTH BASS | F | C | C | M | 7 | 14.00 | 1.64 | 1.07 | 0.34 | 76.29 |
| SPOTTED BASS | F | C | C | | 6 | 12.00 | 1.41 | 2.55 | 0.82 | 212.67 |
| LARGEMOUTH BASS | F | C | C | | 2 | 4.00 | 0.47 | 0.04 | 0.01 | 10.50 |
| GREEN SUNFISH | S | I | C | T | 2 | 4.00 | 0.47 | 0.01 | 0.00 | 3.00 |
| BLUEGILL SUNFISH | S | I | C | P | 8 | 16.00 | 1.87 | 0.21 | 0.07 | 13.13 |
| OR'GESPOTTED SUNFISH | S | I | C | | 1 | 2.00 | 0.23 | 0.01 | 0.00 | 6.00 |
| LONGEAR SUNFISH | S | I | C | M | 14 | 28.00 | 3.28 | 0.30 | 0.10 | 10.64 |
| REDEAR SUNFISH | E | I | C | | 1 | 2.00 | 0.23 | 0.04 | 0.01 | 22.00 |
| SAUGER | F | P | S | | 1 | 2.00 | 0.23 | 0.81 | 0.26 | 406.00 |
| FRESHWATER DRUM | | | M | P | 9 | 18.00 | 2.11 | 7.65 | 2.45 | 425.00 |
| | *Mile Total* | | | | 427 | 854.00 | | 312.04 | | |
| | *Number of Species* | | | | 31 | | | | | |
| | *Number of Hybrids* | | | | 0 | | | | | |

# Species List

| River Code: 14-300 | Stream: **Whitewater River** | Sample Date: **1995** |
|---|---|---|
| River Mile: **4.70** | Basin: Great Miami River | Date Range: 10/04/95 |
| | Time Fished: 3057 sec Drain Area: 1382.0 sq mi | |
| | Dist Fished: 0.50 km No of Passes: 1 | Sampler Type: A |

| Species Name / ODNR status | IBI Grp | Feed Guild | Breed Guild | Tol | # of Fish | Relative Number | % by Number | Relative Weight | % by Weight | Ave(gm) Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| MOONEYE [S] | | I | M | R | 3 | 6.00 | 0.66 | 1.25 | 0.41 | 208.50 |
| SKIPJACK HERRING | | P | M | | 1 | 2.00 | 0.22 | 0.04 | 0.01 | 22.00 |
| GIZZARD SHAD | | O | M | | 48 | 96.00 | 10.50 | 11.55 | 3.82 | 120.31 |
| QUILLBACK CARPSUCKER | C | O | M | | 16 | 32.00 | 3.50 | 16.35 | 5.41 | 510.88 |
| RIVER CARPSUCKER | C | O | M | | 2 | 4.00 | 0.44 | 3.00 | 0.99 | 750.00 |
| HIGHFIN CARPSUCKER | C | O | M | | 5 | 10.00 | 1.09 | 2.91 | 0.96 | 290.60 |
| SILVER REDHORSE | R | I | S | M | 7 | 14.00 | 1.53 | 18.54 | 6.13 | 1,324.43 |
| BLACK REDHORSE | R | I | S | I | 44 | 88.00 | 9.63 | 46.26 | 15.31 | 525.73 |
| GOLDEN REDHORSE | R | I | S | M | 51 | 102.00 | 11.16 | 39.98 | 13.23 | 391.98 |
| SHORTHEAD REDHORSE | R | I | S | M | 11 | 22.00 | 2.41 | 8.90 | 2.94 | 404.55 |
| NORTHERN HOG SUCKER | R | I | S | M | 20 | 40.00 | 4.38 | 4.60 | 1.52 | 115.00 |
| COMMON CARP | G | O | M | T | 17 | 34.00 | 3.72 | 61.20 | 20.25 | 1,800.00 |
| GRAVEL CHUB | N | I | S | M | 49 | 98.00 | 10.72 | 0.36 | 0.12 | 3.63 |
| CREEK CHUB | N | G | N | T | 2 | 4.00 | 0.44 | 0.01 | 0.00 | 3.00 |
| SUCKERMOUTH MINNOW | N | I | S | | 5 | 10.00 | 1.09 | 0.08 | 0.03 | 7.60 |
| EMERALD SHINER | N | I | S | | 6 | 12.00 | 1.31 | 0.05 | 0.02 | 4.17 |
| SPOTFIN SHINER | N | I | M | | 21 | 42.00 | 4.60 | 0.10 | 0.03 | 2.48 |
| SAND SHINER | N | I | M | M | 5 | 10.00 | 1.09 | 0.02 | 0.01 | 1.80 |
| BULLHEAD MINNOW | N | O | C | | 1 | 2.00 | 0.22 | 0.00 | 0.00 | 2.00 |
| BLUNTNOSE MINNOW | N | O | C | T | 8 | 16.00 | 1.75 | 0.05 | 0.02 | 2.88 |
| CENTRAL STONEROLLER | N | H | N | | 30 | 60.00 | 6.56 | 0.43 | 0.14 | 7.17 |
| CHANNEL CATFISH | F | | C | | 31 | 62.00 | 6.78 | 54.11 | 17.90 | 872.76 |
| FLATHEAD CATFISH | F | P | C | | 3 | 6.00 | 0.66 | 13.44 | 4.45 | 2,240.67 |
| STONECAT MADTOM | | I | C | I | 3 | 6.00 | 0.66 | 0.11 | 0.04 | 18.00 |
| WHITE BASS | F | P | M | | 1 | 2.00 | 0.22 | 0.12 | 0.04 | 60.00 |
| WHITE CRAPPIE | S | I | C | | 1 | 2.00 | 0.22 | 0.03 | 0.01 | 16.00 |
| ROCK BASS | S | C | C | | 1 | 2.00 | 0.22 | 0.11 | 0.04 | 55.00 |
| SMALLMOUTH BASS | F | C | C | M | 15 | 30.00 | 3.28 | 5.44 | 1.80 | 181.40 |
| SPOTTED BASS | F | C | C | | 7 | 14.00 | 1.53 | 1.34 | 0.44 | 96.00 |
| GREEN SUNFISH | S | I | C | T | 2 | 4.00 | 0.44 | 0.01 | 0.00 | 3.50 |
| BLUEGILL SUNFISH | S | I | C | P | 1 | 2.00 | 0.22 | 0.01 | 0.00 | 4.00 |
| LONGEAR SUNFISH | S | I | C | M | 18 | 36.00 | 3.94 | 0.67 | 0.22 | 18.72 |
| SAUGER | F | P | S | | 2 | 4.00 | 0.44 | 1.18 | 0.39 | 294.50 |
| BANDED DARTER | D | I | S | I | 3 | 6.00 | 0.66 | 0.02 | 0.01 | 2.67 |
| FRESHWATER DRUM | | | M | P | 17 | 34.00 | 3.72 | 9.97 | 3.30 | 293.33 |
| *Mile Total* | | | | | 457 | 914.00 | | 302.26 | | |
| *Number of Species* | | | | | 35 | | | | | |
| *Number of Hybrids* | | | | | 0 | | | | | |

# Species List

| River Code: **14-300** | Stream: **Whitewater River** | Sample Date: **1995** |
|---|---|---|
| River Mile: **7.20** | Basin: Great Miami River | Date Range: 09/26/95 |
| | Time Fished: 3278 sec Drain Area: 1370.0 sq mi | |
| | Dist Fished: 0.50 km No of Passes: 1 | Sampler Type: A |

| Species Name / ODNR status | IBI Grp | Feed Guild | Breed Guild | Tol | # of Fish | Relative Number | % by Number | Relative Weight | % by Weight | Ave(gm) Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| SKIPJACK HERRING | | P | M | | 1 | 2.00 | 0.23 | 0.05 | 0.01 | 23.00 |
| GIZZARD SHAD | | O | M | | 74 | 148.00 | 17.29 | 15.20 | 4.70 | 102.70 |
| SMALLMOUTH BUFFALO | C | I | M | | 1 | 2.00 | 0.23 | 0.96 | 0.30 | 482.00 |
| QUILLBACK CARPSUCKER | C | O | M | | 2 | 4.00 | 0.47 | 2.72 | 0.84 | 681.00 |
| RIVER CARPSUCKER | C | O | M | | 6 | 12.00 | 1.40 | 5.94 | 1.84 | 495.17 |
| HIGHFIN CARPSUCKER | C | O | M | | 6 | 12.00 | 1.40 | 4.35 | 1.34 | 362.20 |
| SILVER REDHORSE | R | I | S | M | 9 | 18.00 | 2.10 | 20.68 | 6.39 | 1,148.67 |
| BLACK REDHORSE | R | I | S | I | 18 | 36.00 | 4.21 | 14.55 | 4.50 | 404.17 |
| GOLDEN REDHORSE | R | I | S | M | 121 | 242.00 | 28.27 | 75.53 | 23.34 | 312.10 |
| SHORTHEAD REDHORSE | R | I | S | M | 16 | 32.00 | 3.74 | 13.31 | 4.11 | 415.80 |
| NORTHERN HOG SUCKER | R | I | S | M | 16 | 32.00 | 3.74 | 4.12 | 1.27 | 128.75 |
| COMMON CARP | G | O | M | T | 19 | 38.00 | 4.44 | 55.88 | 17.27 | 1,470.47 |
| ROSYFACE SHINER | N | I | S | I | 4 | 8.00 | 0.93 | 0.02 | 0.00 | 2.00 |
| SPOTFIN SHINER | N | I | M | | 7 | 14.00 | 1.64 | 0.06 | 0.02 | 4.57 |
| CENTRAL STONEROLLER | N | H | N | | 3 | 6.00 | 0.70 | 0.21 | 0.07 | 35.67 |
| CHANNEL CATFISH | F | | C | | 43 | 86.00 | 10.05 | 75.12 | 23.21 | 873.47 |
| YELLOW BULLHEAD | | I | C | T | 1 | 2.00 | 0.23 | 0.04 | 0.01 | 21.00 |
| FLATHEAD CATFISH | F | P | C | | 1 | 2.00 | 0.23 | 12.00 | 3.71 | 6,000.00 |
| STONECAT MADTOM | | I | C | I | 2 | 4.00 | 0.47 | 0.06 | 0.02 | 15.50 |
| WHITE BASS | F | P | M | | 8 | 16.00 | 1.87 | 2.77 | 0.86 | 173.14 |
| WHITE CRAPPIE | S | I | C | | 1 | 2.00 | 0.23 | 0.12 | 0.04 | 60.00 |
| ROCK BASS | S | C | C | | 5 | 10.00 | 1.17 | 0.41 | 0.13 | 41.40 |
| SMALLMOUTH BASS | F | C | C | M | 2 | 4.00 | 0.47 | 0.84 | 0.26 | 209.00 |
| SPOTTED BASS | F | C | C | | 6 | 12.00 | 1.40 | 0.33 | 0.10 | 27.50 |
| BLUEGILL SUNFISH | S | I | C | P | 1 | 2.00 | 0.23 | 0.02 | 0.01 | 10.00 |
| LONGEAR SUNFISH | S | I | C | M | 27 | 54.00 | 6.31 | 0.87 | 0.27 | 16.11 |
| SAUGER | F | P | S | | 1 | 2.00 | 0.23 | 0.22 | 0.07 | 108.00 |
| WALLEYE | F | P | S | | 1 | 2.00 | 0.23 | 2.10 | 0.65 | 1,050.00 |
| LOGPERCH | D | I | S | M | 2 | 4.00 | 0.47 | 0.07 | 0.02 | 16.50 |
| GREENSIDE DARTER | D | I | S | M | 1 | 2.00 | 0.23 | 0.01 | 0.00 | 7.00 |
| BANDED DARTER | D | I | S | I | 1 | 2.00 | 0.23 | 0.00 | 0.00 | 2.00 |
| FRESHWATER DRUM | | | M | P | 22 | 44.00 | 5.14 | 15.06 | 4.65 | 342.20 |
| *Mile Total* | | | | | 428 | 856.00 | | 323.61 | | |
| *Number of Species* | | | | | 32 | | | | | |
| *Number of Hybrids* | | | | | 0 | | | | | |

# Species List

| River Code: **14-300** | Stream: **Whitewater River** | Sample Date: **1995** |
|---|---|---|
| River Mile: **7.70** | Basin: Great Miami River | Date Range: 09/26/95 |
| | Time Fished: 2754 sec Drain Area: 1369.0 sq mi | |
| | Dist Fished: 0.47 km No of Passes: 1 | Sampler Type: A |

| Species Name / ODNR status | IBI Grp | Feed Guild | Breed Guild | Tol | # of Fish | Relative Number | % by Number | Relative Weight | % by Weight | Ave(gm) Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| MOONEYE [S] | | I | M | R | 2 | 4.26 | 0.68 | 0.77 | 0.36 | 180.00 |
| GIZZARD SHAD | | O | M | | 93 | 197.87 | 31.74 | 19.22 | 8.97 | 97.13 |
| SMALLMOUTH BUFFALO | C | I | M | | 1 | 2.13 | 0.34 | 4.95 | 2.31 | 2,325.00 |
| QUILLBACK CARPSUCKER | C | O | M | | 8 | 17.02 | 2.73 | 6.03 | 2.82 | 354.50 |
| RIVER CARPSUCKER | C | O | M | | 9 | 19.15 | 3.07 | 11.22 | 5.24 | 585.78 |
| HIGHFIN CARPSUCKER | C | O | M | | 13 | 27.66 | 4.44 | 8.12 | 3.79 | 293.38 |
| SILVER REDHORSE | R | I | S | M | 6 | 12.77 | 2.05 | 9.04 | 4.22 | 708.17 |
| BLACK REDHORSE | R | I | S | I | 32 | 68.09 | 10.92 | 31.24 | 14.59 | 458.88 |
| GOLDEN REDHORSE | R | I | S | M | 41 | 87.23 | 13.99 | 35.76 | 16.69 | 409.89 |
| SHORTHEAD REDHORSE | R | I | S | M | 16 | 34.04 | 5.46 | 12.82 | 5.99 | 376.60 |
| RIVER REDHORSE [S] | R | I | S | I | 1 | 2.13 | 0.34 | 5.98 | 2.79 | 2,810.00 |
| NORTHERN HOG SUCKER | R | I | S | M | 10 | 21.28 | 3.41 | 4.28 | 2.00 | 201.20 |
| COMMON CARP | G | O | M | T | 12 | 25.53 | 4.10 | 47.96 | 22.39 | 1,878.33 |
| SPOTFIN SHINER | N | I | M | | 8 | 17.02 | 2.73 | 0.03 | 0.01 | 1.75 |
| BLUNTNOSE MINNOW | N | O | C | T | 1 | 2.13 | 0.34 | 0.00 | 0.00 | 2.00 |
| CENTRAL STONEROLLER | N | H | N | | 9 | 19.15 | 3.07 | 0.06 | 0.03 | 3.33 |
| CHANNEL CATFISH | F | | C | | 6 | 12.77 | 2.05 | 7.84 | 3.66 | 613.83 |
| STONECAT MADTOM | | I | C | I | 1 | 2.13 | 0.34 | 0.00 | 0.00 | 2.00 |
| WHITE BASS | F | P | M | | 3 | 6.38 | 1.02 | 0.69 | 0.32 | 108.67 |
| SMALLMOUTH BASS | F | C | C | M | 2 | 4.26 | 0.68 | 2.75 | 1.28 | 645.00 |
| SPOTTED BASS | F | C | C | | 1 | 2.13 | 0.34 | 0.02 | 0.01 | 10.00 |
| LONGEAR SUNFISH | S | I | C | M | 9 | 19.15 | 3.07 | 0.47 | 0.22 | 24.78 |
| PUMPKINSEED SUNFISH | S | I | C | P | 1 | 2.13 | 0.34 | 0.02 | 0.01 | 7.00 |
| SAUGER | F | P | S | | 2 | 4.26 | 0.68 | 0.70 | 0.33 | 164.50 |
| GREENSIDE DARTER | D | I | S | M | 1 | 2.13 | 0.34 | 0.02 | 0.01 | 10.00 |
| FRESHWATER DRUM | | | M | P | 5 | 10.64 | 1.71 | 4.19 | 1.96 | 394.20 |
| | *Mile Total* | | | | 293 | 623.40 | | 214.18 | | |
| | *Number of Species* | | | | 26 | | | | | |
| | *Number of Hybrids* | | | | 0 | | | | | |

# Greenspace Concept Plan

## Purpose

The intent of the Greenspace Concept Plan is to promote a broad comprehensive vision for greenspace protection and restoration within Hamilton County. This conceptual plan, as it evolves, will promote complementary development and establish a common agenda and direction for the varied efforts of the many necessary participants – representatives of local and regional parks, conservation and civic groups, potential user groups, economic, business and real estate groups, government, etc. In this way, the Greenspace Concept is a framework for more detailed planning of opportunities for open space protection and trail connections.

Future refinement of the Greenspace Concept and development of a more detailed Greenspace Plan with implementation strategies will lead to the creation or enhancement of a system of natural corridors, countywide trail system, preservation of scenic views, and protection and restoration of critical natural areas. Public involvement through education and private property stewardship will also be key elements.

## Importance

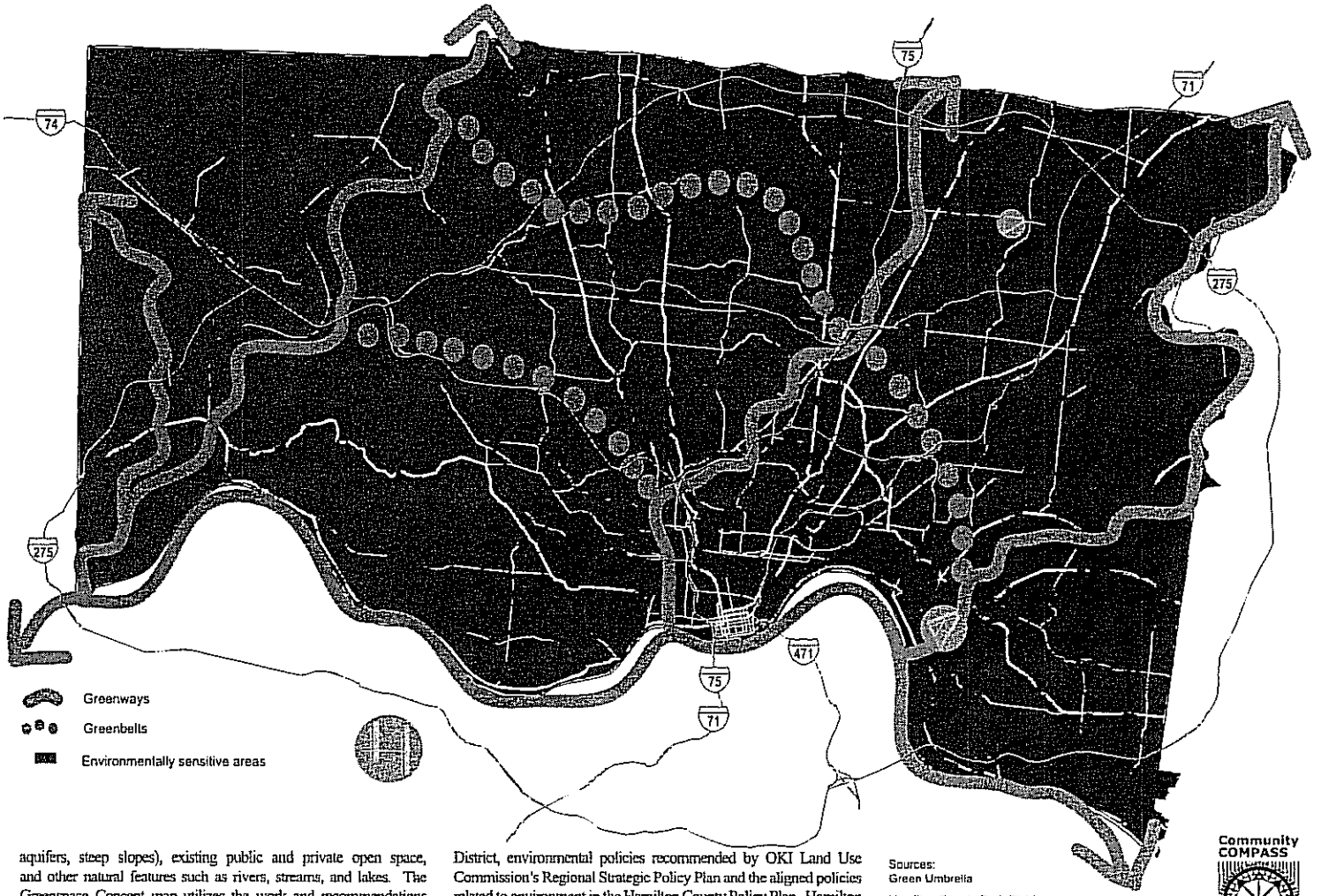
The natural environment has strongly influenced the development and urbanization of Hamilton County throughout its history. Forested hillsides, rivers and streams, floodplains, and open plains provide for the County's environmental diversity and continue to be vital components in the social and economic development of the region today. Preservation, conservation, and restoration of natural resources, along with sustainable development, encourages residents and businesses to stay and promotes investment in Hamilton County's future.

Unlike the past 50 years, where economic growth and new housing options were tied to the development of "greenfield" sites at the edge of the urbanized area, the future health of the County will be based upon its attraction as a sustainable, desirable, and healthy place to work, live, and play.

Implementation of the Greenspace Concept will assure future concentrations of tree canopy, which improves air filtration, erosion control, water quality and overall quality of life in the area. The Concept Plan will also promote conservation of corridors that provide connected habitats for land and aquatic plants and animals, which ensure survival of species more successfully than smaller disjointed areas.

## Formation

The Greenspace Concept has evolved from the identification of environmentally critical and sensitive areas (e.g., flood zones, aquifers, steep slopes), existing public and private open space, and other natural features such as rivers, streams, and lakes. The Greenspace Concept map utilizes the work and recommendations of various organizations including the recent HCRPC State of the County Report on environment as well as the nine county Regional Greenprint prepared by Green Umbrella*, and extensive geographic and environmental analyses completed by the Hamilton County Park District, environmental policies recommended by OKI Land Use Commission's Regional Strategic Policy Plan and the aligned policies related to environment in the Hamilton County Policy Plan. Hamilton County's Greenspace Concept is designed to be consistent with, and supportive of, the Regional Greenprint prepared in April 2004 by Green Umbrella in collaboration with Hamilton County Park District.




Sources:
Green Umbrella

Hamilton County Park District

Hamilton County 2030 Plan and Implementation Framework

Community COMPASS Report No. 17 - Version 1
*A Community Workbook for Implementation Partners.*
November 2004.

Community COMPASS
HAMILTON COUNTY
Regional Planning Commission

## Components

Hamilton County's Greenspace Concept Plan is a series of natural corridors which serve as an organizing framework for our county, linking communities to each other and to our environment. The Concept Plan is intended to promote a broad, comprehensive vision for greenspace protection, conservation, and restoration within Hamilton County for current residents and future generations. The Greenspace Plan is a first attempt to identify our most important greenspaces – those that merit the highest priorities for preservation and restoration. Planned green or open space, much like our planned transportation system, involves creating a "green infrastructure" that provides a connected, integrated network of sustainable green or open spaces to maintain natural resources, forest and farm land, protection of scenic landscapes, and preservation of historic and cultural resources. Like the region's roads, green spaces are a shared resource, connecting communities across political boundaries. Planning for greenwoods, greenways, and greenbelts as defined below promotes preservation and conservation of our uniquely beautiful, diverse landscape throughout the County.

## Definitions

**Open, or green, spaces.** Open space includes both natural and maintained areas of land and water that are either publicly or privately owned. Natural areas include forested hillsides, preserves, wetlands and riparian corridors, rivers and streams, and undeveloped land. Maintained areas include managed forest and farm land, neighborhood and metropolitan parks and outdoor recreational areas, historic and cultural property, golf courses, and cemeteries.

**Greenwoods.** Greenwoods are defined as wide, uninterrupted expanse of land. Greenwoods act as hubs, or "anchors", for a variety of natural processes and recreational features and provide the origin or destination for wildlife. These anchors include preserves, managed forest and farm land, and parks and open space areas.

**Greenways.** Greenways are defined as linear corridors of green space that often follow old or existing land or water routes, including waterways, stream valleys, and ridge tops, and provide linkage between natural, and/or maintained features or designations. Some greenways function as recreational corridors (walking or bike paths) or historic and scenic viewsheds and others function almost exclusively for environmental protection.

**Greenbelts.** Greenbelts are defined as linking corridors of green space that provide a partition between land uses, mitigate noise and air pollution, and act as travel corridors for wildlife and plant life. Often they form a visual and physical relief in the landscape, such as along ridge tops and along transportation routes.

Both greenways and greenbelts provide migration paths for animals moving across the land and for plants expanding or changing their habitats. Overall, greenways and greenbelts protect natural, cultural and scenic resources, provide recreational benefits, enhance our quality of life, and encourage sustainable growth.

## Consistency With Related Plans

Converting the Greenspace Concept into a more detailed plan and related action strategies requires alignment and consistency with the efforts and recommendations of many organizations. Refinement, implementation, and amendment of the Greenspace Concept Plan should be consistent with:

- Community COMPASS Vision for Environment
- Community COMPASS Core goals (with emphasis on Goal 4 – Balancing Development and the Environment)
- Community COMPASS initiatives and strategies:
  - Initiative 23 - Regulations to Protect Natural Resources
  - Initiative 24 - Countywide Greenspace Plan
- Hamilton County Policy Plan for transportation (adapted from the OKI Land Use Commission's Strategic Regional Policy Plan)
- Green Umbrella Regional Greenprint
- Hamilton County Park District Strategic Plan
- Local government plans for parks, conservation, and greenspace
- Mill Creek Watershed Greenway Master Plan
- Anderson Township Greenspace Advisory Committee
- Ohio River Way
- Little Miami River Partnership
- Friends of the Great Miami and Rivers Unlimited Sustaining a River report
- Cincinnati Parks Department Greenspace Program

## Next Steps

- Convene public forums and key partner meetings to discuss the State of the County Report on environment, key indicators of progress, and policy plan recommendations
- Refine implementation campaign and priorities
- Establish partner commitments
- Develop action plans for Community COMPASS strategies pertaining to:
  - Initiative 23 - Regulations to Protect Natural Resources
  - Initiative 24 - Countywide Greenspace Plan
- A more detailed study of greenspace opportunities should be designed to accomplish the following objectives:

  1. to assist communities to inventory and prioritize natural, cultural and recreational resources.
  2. to demonstrate how local greenspace priorities can be linked throughout each community and the region to form continuous corridors of open space that protect resources that cross community boundaries.
  3. to explain how each community can more effectively employ land use techniques to protect meaningful open space as land is developed and redeveloped.
  4. to demonstrate the multiple values of forestland for recreation , water quality protection, and habitat protection.
  5. to identify areas with multiple resource values and promote conservation of landscape character.
  6. to clarify priorities of key stakeholders and foster partnerships to achieve shared goals.

## Potential Key Partners

Potential partners for refining and implementing the plan and initiatives include:

- Local Planning Commissions and Greenspace Committees
- Green Umbrella (and partner organizations)
- OKI Greenspace Office
- Hamilton County Parks District
- Ohio River Way
- Hamilton County Soil and Water Conservation District
- Watershed Councils
- Conservancy Districts
- Land Conservancies
- Friends of Great Miami River
- Imago, Inc
- Little Miami, Inc.
- Little Miami River Partnership
- Local Alliance for Nature and Development
- Mill Creek Restoration Project
- Oxbow Inc.
- Smart Growth Coalition
- Western Wildlife Corridor, Inc.
- Planning Partnership

## Implementation Resources

A broad base of community support for preservation, restoration and conservation is reflected in the passage of the Ohio Conservation Fund in 2000, and, locally, in Hamilton County resident's support for the 2002 15-year, 1-mill replacement park levy. This levy gives Hamilton County Park District's (HCPD) Green Space Preservation Projects resources to add critical lands to existing parks and connect existing and proposed parklands to achieve multiple compatible objectives. Objectives include promoting naturally functioning ecosystems, floodwater management, reduction of air and water pollution, wildlife habitat protection and creation, and the preservation of open space.

Planning Partnership
HAMILTON COUNTY
Regional Planning Commission

**The Planning Partnership** is a collaborative initiative of the Hamilton County Regional Planning Commission. The Partnership – open to all political jurisdictions in the County and to affiliate members in the public, private, and civic sectors – is an advisory board that works to harness the collective energy and vision of its members to effectively plan for the future of our County. Rather than engaging in the Planning Commission's short-range functions such as zoning reviews, the Planning Partnership takes a long-range, comprehensive approach to planning, working to build a community that works for families, for businesses and for the region. The Partnership firmly believes that collaboration is the key to a positive, competitive, and successful future for Hamilton County.

Community COMPASS
HAMILTON COUNTY
Regional Planning Commission

**Community COMPASS** (Hamilton County's Comprehensive Master Plan and Strategies) is a long-range plan that seeks to address mutual goals related to physical, economic, and social issues among the 49 communities within Hamilton County. Through a collective shared vision for the future based on the wishes and dreams of thousands of citizens, Hamilton County now has direction to chart its course into the 21st century.

In developing a broad vision with broad support, Community COMPASS will help ensure that trends are anticipated, challenges are addressed, priorities are focused, and our collective future is planned and achieved strategically over the next 20 to 30 years. Through an in-depth analysis of all aspects of the County, the multi-year process will result in a comprehensive plan.

Visit planningpartnership.org and communitycompass.org for more information.

**Hamilton County Regional Planning Commission**
138 East Court Street, Room 807
Cincinnati, OH 45202
513-946-4500 | www.hamilton-co.org/hcrpc

# Appendix D

Mainstream
Restoration, Inc.

## Dale E. Miller, CPESC

HYDROLOGIST/FLUVIAL GEOMORPHOLOGIST

**Summary**

Mr. Miller, a Certified Professional in Erosion and Sediment Control, has over 24 years of applied experience in stream restoration. He has managed hundreds of stream channel restoration, fish habitat improvement, and bioengineered riverbank stabilization projects nationally. He has renaturalized stream channels requiring creative channel design approaches that integrate flood control, sediment management and riparian habitat with morphological and hydraulic functionality. Mr. Miller has undertaken several complicated multi-million dollar restoration projects. He has developed innovative techniques, such as an award-winning bioengineered stream bank stabilization method successfully used on dozens of projects. Mr. Miller has taught courses in process-based channel design, and is adept at conveying complex technical concepts to lay audiences. He has raised the bar of quality in a maturing industry by challenging the status quo and pushing the envelope on new approaches. For example, his chapter entitled *Establishing a Standard of Practice for Natural Channel Design Using Design Criteria* was published last year in the award-winning book *Restoration of Puget Sound Rivers.*

**Technical Expertise**

Scoping, Alternatives Evaluation and Design
Stream Channel and Floodplain Restoration
Bioengineered River Bank Stabilization
Fish Habitat Enhancement

**Communication Expertise**

Writing: memos, reports, articles
Reviewing: editing, clarifying, summarizing, critiquing
Speaking: extemporaneous speaking, formal presentations, teaching
Facilitating: identifying common ground, soliciting involvement, encouraging consensus

**Professional Affiliations and Registrations**

Certified Professional in Erosion and Sediment Control (CPESC No. 804)
American Fisheries Society
American Water Resources Association
Land and Water Magazine Editorial Board
SCUBA certified

**Education**

BS, Water Resources, Minors in Biology and English, Allegheny College, PA 1977

40-Hour OSHA Training 29 CFR 1910.120

Applied Fluvial Geomorphology, 1993. Wildland Hydrology Consultants

Fellowship in International Development, Partners of the Americas/W.K. Kellogg Foundation, 1992-1994 (Montana Partners President 1989-1992)

Specialized Water Quality Training, U.S. Geological Survey, 1979

**Employment History**

*Mainstream Restoration, Inc., Principal, 2002-present.* Coordinate multi-firm project teams to scope, plan, design, construct, and review stream stabilization and restoration projects in over a half a dozen states in the Midwest and west.
*Inter-Fluve, Inc., Co-Founder, Principal, Montana Office Manager, 1983-2002.* Co-founded a stream and riparian restoration company. Grew the Montana office to a staff of 12 with $1 million annual revenue; responsible for day-to-day management of technical operations. Provided project oversight in more than 15 states in a variety of technical, political, and economic settings. Established a national reputation as a leader in the river restoration field. *2002-present.* Non-participating co-owner.
*Timberline Reclamation, Inc., Senior Operations Manager, 1982-1983.* Managed a technical staff of four natural resource scientists; designed and implemented fish habitat enhancement projects.
*U.S. Forest Service, Willamette NF, Hydrologist and Hydrologic Technician, 1980-1981.*
*U.S. Geological Survey, Water Resources, 1978-1979.*

**Selected Project Experience**

*Rosewood Creek Restoration, Incline Village, NV.* Mr. Miller provided continuous daily construction inspection services for a $1.2 million channel and floodplain restoration project over a two-month period. A new 3,400 foot long stream was constructed using coir fabric-wrapped soil lifts over streambed gravel, with periodic rock step-pools and flooding basins to encourage sediment deposition, with the primary goal of improving Lake Tahoe water quality. As Owner's representative, Mr. Miller undertook various redesigns, fit-in-field adjustments, and balancing of designed grade with actual topographic conditions. After a relatively small storm event identified limits in the original design, Mr. Miller worked with the project designers and undertook subsequent redesign and repair of the rock-step reaches.

*Rosewood Creek Geomorphic and Riparian Assessment, Incline Village, NV.* Mr. Miller is currently undertaking a study for the Nevada Tahoe Conservation District to assess the geomorphic condition of the upper mile-long reach of Rosewood Creek to provide the basis for SEZ restoration. The work will include determining the sediment contribution of particular subreaches.

*Boggy Creek, Little Walnut Creek and Walnut Creek Watershed Improvement Projects, Austin, TX.* Mainstream Restoration is contracted to URS Corporation to assist with the Capital Improvements Program Projects and Preliminary Engineering Study for the Watershed Protection Department of the City of Austin. The project involves two watersheds and numerous tributaries, covering a number of miles within an urban setting. Mr. Miller is the Task Leader for the Erosion

# Dale E. Miller, CPESC

Control & Streambank Stabilization component. The work involves geomorphic and hydraulic analysis (stream channel stability analysis, sediment transport modeling and riparian vegetation characterization), alternatives identification and analysis, and preliminary design.

*San Antonio River Restoration, San Antonio, TX.* Mr. Miller lead a subconsultant team that provided preliminary design services to Ford, Powell & Carson Architects & Planners, Inc. and Carter & Burgess, Inc., firms who lead the preliminary design of the Museum and Mission Reaches, a total of 13 miles of the San Antonio River. Mr. Miller developed the subconsultant's work scope and budget, and undertook the geomorphic field analysis of both reaches of the river.

*Urban Fishing Pond Along Clear Creek, Carson City, NV.* Mainstream Restoration is currently under subcontract with Lumos and Associates to provide designs, plans and specifications for a 1-acre pond at Fuji Park, at the County fairgrounds and adjacent to Clear Creek. A wetland is being incorporated to serve as a stormwater detention and water quality improvement basin. Thirty percent plans have been completed.

*Third Creek Fish Passage, Incline Village, NV.* The Nevada Dept. of Transportation contracted with MACTEC Engineering and Consulting to design highway-related erosion control measures along a reach of Highway 28 through Incline Village. As a sub-consultant, Mr. Miller provided technical expertise regarding geomorphic conditions and fish passage for the feasibility assessment that addressed the highway crossing. He prepared a technical memorandum outlining fish passage design criteria specific to the project site. A concrete box culvert partially filled with cobbles and gravels to simulate natural channel conditions was selected as the preferred alternative. Mainstream Restoration was also contracted to Loomis and Associates to provide design of fish passage at six locations on Third Creek within the IVGID Champion Golf Course. Five culverts were removed and a rock drop modified to provide passage for rainbow trout. Mr. Miller developed a hydraulic model and undertook the design of a cascade step-pool channel through the passage obstructions. Bioengineered stabilization measures were employed for the upper stream banks. He prepared draft final design plans for the channel profiles, sections and details. He also authored draft final specifications.

*Lake Forest Erosion Control Project, Tahoe City, CA.* Mr. Miller undertook a geomorphic assessment of Lake Forest and Polaris Creeks, as part of a Placer County erosion control project. The California Tahoe Conservancy, as a project partner, was interested in opportunities for Stream Environment Zone (SEZ) restoration. Using geologic, soils, topographic and geomorphic information, he demonstrated that both streams had been routed into new courses since the Comstock era. He identified a number of SEZ alternatives that primarily focused on wet meadow restoration associated with channel reorientation.

*Mill Creek Flow Restoration Assessment, Incline Village, NV.* Mill Creek, a small, ephemeral tributary, has been dammed since 1962. For the last two decades, flows in the lower Mill Creek were a result of water pumped out of the impoundment. A project involving the reconstruction of a diversion and bypass to again allow flow into Mill Creek is under consideration by Incline Village. Mr. Miller designed and undertook an assessment to identify the potential beneficial and adverse effects of flow restoration, probable means to mitigate any potential impacts, and opportunities for Stream Environment Zone (SEZ) improvement.

*Cave Gulch Watershed Improvement Project, Canyon Ferry, MT.* After the 2000 Cave Gulch forest fire, storms caused debris flows in the upper basin and floods through a community at the lower end of the drainage. An indistinct ephemeral channel between the buildings was downcut as much as 5 feet in places, undermining foundations and exposing septic drainfields. The project, an emergency action by the NRCS, involved a fast-track two-month schedule. Mr. Miller led the geomorphic evaluation of the watershed, identifying zones of debris flow and systemic aggradation. Mr. Miller co-authored a Watershed Improvement Plan and prepared construction-ready design plans for the selected alternative, which included a 50-foot wide, geocell-lined flood conveyance corridor, selected placement of earthen berms and a concrete floodwall.

*Watercourse Projects for Milwaukee Metropolitan Sewerage District, WI.* Mr. Miller has provided MMSD with a wide range of technical assistance during the development and implementation of the District's Watercourse projects, including: project coordination and management, channel restoration design, streambank bioengineering, geomorphic assessment, sediment transport analysis, and peer design review. Currently he is contributing to the Underwood Creek Rehabilitation and Flood Management Study, developing alternatives for concrete removal; design of the diversion associated with the 800-acre-ft stormwater detention basin at the Milwaukee County Grounds; and the $400,000 Root River Sediment Transport Study. Last year he assisted with the design of the Underwood Creek Restoration at the South Branch confluence. Previously, Mr. Miller managed the final channel design and conceptual design team on Phases 1 and 2 of the $100 million Lincoln Creek Flood Control Project, respectively. He managed a $440,00 geomorphic and sediment transport study of 63 miles of the Menomonee River basin, which was designed to serve as a GIS-based planning tool. Mr. Miller was also involved to varying degrees with these additional projects: Milwaukee Watercourse System Planning; Menomonee River Drop Structure Removal and

Channel Restoration; Hoyt Park Streambank Stabilization on the Menomonee River; Watercourse Design Specifications Review and Update; Menomonee River Advanced Planning and Preliminary Design; Kinnickinnic River Advanced Planning and Preliminary Design; and the Underwood Creek Preliminary Design. For many of these projects, Mr. Miller managed the channel design as a specialty sub-consultant.

*Lower American River Bank Stabilization, Sacramento, CA.* On behalf of the Sacramento Area Flood Control Agency, over the course of a year and a half, Mr. Miller provided technical contributions to proposed bioengineered bank stabilization measures within the City of Sacramento, and contributed to both a multi-agency Task Force and a Technical Advisory Group directed to select solutions by consensus. Five sites, covering a total of 11,000 feet were under consideration. Mr. Miller co-authored a number of reports: rates of woven coir (coconut) fabric degradation; methods of cellular configuration of fabric-encapsulated soil, and stability under anticipated failure modes; plant root and shoot growth rates, density, length and volume for selected herbaceous species for proposed bioengineered treatments; and applicability of a biodegradable coir mat hydroponically pre-grown with herbaceous species.

*Beaver Creek Restoration Project, York, MT.* Mr. Miller coordinated a team to evaluate the restoration opportunities of a Missouri River tributary. Due to chronic incision there was a lack of connectivity between the channel and floodplain and habitat quality was considered poor. Portions of the lower project reach were ephemeral due to seepage loss. Mr. Miller managed a team to develop restoration alternatives based on local analog reaches. He prepared a feasibility assessment, detailing the components and costs for four alternatives. Alternatives included lowering the surrounding ground surface (to reconnect the floodplain) and meandering the channel within the enlarged floodplain. Mr. Miller is currently working with the project team to prepare plans and specifications for the preferred alternative.

*Washington State Integrated Streambank Protection Guidelines.* Mr. Miller lead a project team to revise, rewrite, edit and finalize the Integrated Streambank Protection Guidelines, a multi-agency tool for establishing acceptable approaches, methods, and techniques for stream bank stabilization. The Guidelines were prepared in light of the Endangered Species Act for a wide audience: regulators, design engineers, and planners and decision makers involved with aquatic resource policy. Mr. Miller also authored a white paper on channel design, the precursor to a Guideline on the same topic. Recently Mr. Miller worked with the State to develop and implement training classes for those who will use the guidelines.

*Stone Creek Restoration Project, Dillon, MT.* This project, the latest in a series of restoration activities in the watershed, focused on an 8,500 foot-long reach of stream. The objectives were to improve aquatic habitat complexity (by providing depth and cover for fish during late summer and winter low flows); increase riparian health; improve channel stability; and increase the distance between an adjacent road and the creek. Design was based on re-establishing fluvial processes. The work provided for the fluvial processes of sediment transport and gradual channel adjustment, while encouraging habitat complexity. Mr. Miller undertook all design, acquired all permits, and managed all aspects of construction.

*Stabilization of the Little Miami River at Lake Isabella Park, Cincinnati, OH.* Prepared a geomorphic analysis, feasibility assessment, and conceptual plan for composite bioengineered bank stabilization along 1,200 feet of eroding bank on a Wild and Scenic River at a county park. Coordinated geotechnical and hydraulic analysis to complete preliminary design. Conducted meetings with skeptical stakeholders to demonstrate causes and extent of problem, explain the viability of non-traditional stabilization solutions, and describe the selected stabilization measures. Established a consensus on need for action and suitability of bioengineered measures, resulting in eventual permit approvals. Coordinated the preparation of construction-ready plans and specifications, and intermittent construction oversight during the $1.1 million implementation phase.

*Big Spring Creek Restoration & Renaturalization, Lewistown, MT.* As part of a design-build effort, Mr. Miller lead a project team to relocate 4,000 feet of stream from a channelized to a meandering configuration. In order to develop a riparian corridor and create and enhance wetlands, he acquired $80,000 of additional funding from the Montana Department of Transportation. Mr. Miller managed the construction phase, which involved excavation in soft, saturated ground conditions and necessitated specialized equipment. Due to inadequate subsurface materials, facilitated additional funding and technical assistance valued at over $100,000 to place suitable gravels as streambed material.

*River Road Landfill Remedy, Somerset, NJ.* Mr. Miller coordinated the Remedy Selection and Design phases for a $3 million bioengineered bank stabilization project along the Raritan River adjacent to an abandoned landfill. The project entailed developing design criteria, characterizing the river hydrology, evaluating the vegetation component, investigating the geotechnical aspects and identifying bioengineering alternatives. Work included development of a Remedy Selection Report, regulatory permits, construction specifications and a plan set of over 60 sheets.

*Acid Brook Cleanup, Pompton Lakes, NJ.* Mr. Miller coordinated the stream component of a multi-million dollar remediation project for a Fortune 100 corporation. The project entailed excavation

and reconstruction of the entire stream channel and floodplain to the original configuration utilizing bioengineered stream bank revetment techniques. Activities included development of a digital terrain model of 2.5 miles of channel, hydraulic modeling, authoring of a design document, production of construction-ready plans, and construction inspection of the stream work.

*Wade Lake Spawning Channel, Ennis, MT.* Mr. Miller designed and constructed 600 ft of trout spawning channel for a blue ribbon lake fishery near Yellowstone Park. Spring flows were consolidated and routed into a channel designed to maximize preferential spawning depth, velocity, substrate size and proximity to cover. Mr. Miller coordinated state and federal agency involvement using a design-build contract. He conducted a feasibility assessment, prepared designs, and provided construction oversight. Construction methods included elaborate dewatering and water quality preservation techniques. The new fish channel included a headgate and fish ladder. The lake stocking program was rendered unnecessary due to the resulting successful natural propagation.

*Snowflake Spring Creek, Big Sky, MT.* Mr. Miller conducted a feasibility assessment for the creation of a 4,000-foot long spring creek by diverting spring flow across a valley bottom. He explored the technical, permitting, economic, and social implications of the project. He prepared a 30% completion level design of the project, consisting of a design report and plan set. Mr. Miller conducted a study of the potential project's effects on ice formation and winter fish habitat utilization of the adjacent West Gallatin River.

**Publications**

Miller, D.E., and P.B. Skidmore. 2003. Establishing a standard of practice for natural channel design using design criteria. In: Restoration of Puget Sound Rivers. D.R. Montgomery, S.M. Bolton, D.B. Booth and L. Wall (eds.). UW Press, Seattle, WA.

Skidmore, P.B., F.D. Shields, M.W. Doyle and D.E. Miller. (2002). A categorization of approaches to natural channel design. ASCE River Restoration Conference, Reno, NV.

Miller, D.E., and P.B. Skidmore. 2001. Natural channel design: how does Rosgen classification-based design compare with other methods? In: Proceedings of ASCE Wetlands/River Restoration Conf., Reno, NV.

Miller, D.E. 2000. Bioengineered riverbank stabilization project. Geotechnical Fabrics Report 18(3): 34-40.

Doyle, M.W., D.E. Miller, and J.M. Harbor. 1999. Should river restoration be based on classification schemes or process models? Insights from the history of geomorphology. In: ASCE River Restoration Mini-Symposium, International Water Resources Engineering Conf. Seattle, WA.

Miller, D.E. 1999. Deformable stream banks: can we call it a natural channel design without them? AWRA Spec. Conf., Bozeman, MT.

Fotherby, L. M., T.R. Hoitsma, and D.E. Miller. 1998. Bioengineered bank stabilization on the Little Miami River. In: ASCE Bank Stabilization Mini-Symposium, International Water Resources Engineering Conf., Memphis, TN.

Miller, D.E. and P. Skidmore. 1998. The concept of deformable banks for stream bank stabilization and reconstruction. In: ASCE Bank Stabilization Mini-Symposium, International Water Resources Engineering Conf., Memphis, TN.

Miller, D.E. and T R. Hoitsma. 1998. Fabric-encapsulated soil method of stream bank bioengineering: a case study of five recent projects. In: ASCE Wetlands and River Restoration Conf., Denver, CO.

Miller, D.E, T.R. Hoitsma, and D. White. 1998. Degradation of woven coir fabric from field samples. In: ASCE Wetlands and River Restoration Conf. Denver, CO.

Miller, D.E. 1997. Fabric-encapsulated soil method for river bank stabilization. Geotechnical Fabrics Report. 15(1): 48-53.

Miller, D.E. 1996. Design Guidelines for Bioengineered River Bank Stabilization. In: Proceedings of the International Erosion Control Association 27th Annual Conf., Seattle, WA.

Miller, D.E. 1992. Bio-engineered Stream Channel Used to Restore New Jersey Brook. Land & Water 36:12-14.

**Presentations, Conferences and Seminars**

Basis of Design for a Fish Barrier in German Gulch near Anaconda, MT. Montana American Fisheries Society Annual Meeting. 2005. Missoula, MT.

Installation of a Flood Conveyance Corridor on a Developed Alluvial Fan Following Floods in a Burned Watershed. Montana Association of Floodplain Managers. 2004. Big Sky, MT.

Practitioners At Risk: Managing Risk and Uncertainty in Stream Restoration. Montana American Fisheries Society Annual Meeting. 2004. Whitefish, MT.

Process Based Channel Design – A Short Course (Inter-Fluve, Inc.). Present and co-instruct 5-day short course on natural channel design for consultants, engineers, and regulatory agencies. Annually 1996-2001.

Sedimentation Engineering Design in River Restoration: Construction-Phase Activities. Short Course. 1999 ASCE International Water Resources Engineering Conf. Seattle, WA.

Shear Stress Resistance of Naturally Vegetated Stream Banks. 1999 ASCE International Water Resources Engineering Conf. Seattle, WA.

# Dale E. Miller, CPESC

Urban Channel Design and Rehabilitation Short Course, University of Wisconsin-Madison. Sections on Design Criteria, Channel Design and Bank Stabilization. Feb. 1998 and Feb. 1999.

The Concept of Deformable Banks for Stream Bank Stabilization and Reconstruction. 1998 ASCE Bank Stabilization Mini-Symposium, International Water Resources Engineering Conf., Memphis, TN.

Fabric-Encapsulated Soil Method of Stream Bank Bioengineering: A Case Study of Five Recent Projects and Degradation Rates of Woven Coir Fabric Under Field Conditions. 1998 ASCE Wetlands and River Restoration Conf., Denver, CO.

Coir Fabric in Bioengineered Streambanks: An Evaluation of its Performance. 1998 International Erosion Control Association. Reno, NV.

Design Guidelines for Bioengineered River Bank Stabilization. 1996 International Erosion Control Association 27th Annual Conf., Seattle, WA.

Invited Panelist: Management of Watershed Development. 1995 Clean River Taiwan Seminar. US-AEP, Taiwan EPA, American Institute in Taiwan. Taipei, Taiwan, R.O.C.

**Expert Testimony**

*Mitchell Slough, MT.* Worked with Montana Department of Fish, Wildlife and Parks on a case regarding the defense of public access to waters of the state. Work involved coordinating the hydraulic modeling of the adjacent river and aerial photographic-based geomorphic interpretation. Provided deposition and testimony before an administrative law judge.

*Silver Bow Creek and Clark Fork River, MT.* Authored and critiqued numerous technical reports, provided consultation and was deposed regarding stream channel and floodplain reconstruction for the Natural Resource Damage Program as part of their litigation with Atlantic Richfield Company regarding two Superfund sites. Case settled out of court.

*North Creek Business Park, WA.* Provided testimony and rebuttal through 5 days of hearings before an administrative law judge regarding the feasibility and design aspects of a proposed major stream relocation project in the Puget Sound area that had been appealed through the State Shoreline Permit Process.

*Pine Creek, MT.* Provided technical data and testified before the Department of Natural Resources and Conservation in a water rights dispute over a proposed micro-hydropower project.

*Ross Creek, MT.* Provided data and testified before the Department of Natural Resources and Conservation in a water rights dispute over a proposed micro-hydropower development.

*Cedar Creek, MT.* Testified before the Department of Natural Resources and Conservation in a dispute regarding installation of flow measuring flumes and weirs for in-stream flow monitoring.

# Table 4

Selected projects undertaken within the last five years by Mainstream Restoration, Inc. (2002 to present) or by Dale Miller while with a previous firm (prior to 2002).

| *Project Name* | *Location* | *Scope* | *Year(s)* | *Cost (Construction)* | *Contact Person* |
|---|---|---|---|---|---|
| Underwood Creek Restoration (at South Branch Confluence) | Milwaukee, WI | Geomorphic assessment; channel design; preparation of plans and specifications; construction oversight | 2003-2004 | $500K | Dave Fowler<br>Milwaukee Metropolitan Sewerage District<br>260 W. Seeboth St.<br>Milwaukee, WI 53204<br>414-277-6368 |
| Underwood Creek Rehabilitation and Flood Management Study (Concrete Removal) | Milwaukee, WI | Fish passage; preliminary channel and floodplain design | 2004-present | Est $6 Million | Dave Fowler<br>Milwaukee Metropolitan Sewerage District |
| Lincoln Creek Flood Control Management Design, Phase 1 to Final Design and Phase 2 to Conceptual Design | Milwaukee, WI | Coordinated project team to assess, plan and design restoration of 8 miles of urban channel | 1997-2000 | $100 Million | Tom Chapman<br>Milwaukee Metropolitan Sewerage District |
| Rosewood Creek Restoration | Incline Village, NV | Channel and floodplain design prepared plans and specifications; full-time construction oversight | 2003 | $1.2 Million | Joe Pomroy, P.E.<br>Incline Village General Improvement District<br>1220 Sweetwater Road<br>Incline Village, NV 89451<br>775-832-1269 |
| Cave Gulch Restoration | Helena, MT | Watershed geomorphic assessment and planning; reach specific design; preparation of plans and specifications | 2002-2003 | $300K | Rudy Tantare<br>US Forest Service<br>Townsend, MT<br>406-266-3425 |

Hamilton County Natural Resources Assistance Council
Ohio Public Works Commission - District 2

## CLEAN OHIO CONSERVATION PROGRAM

# Scoring Methodology for Grant Applications

(For definition of terms, refer to attached Ohio Conservation Fund Glossary of Terms)

Project Name: Whitewater River Bank
Applicant Name: UCPD
Applicant Contact: Ross Ramke State Code: 061-02837
Rating Team: Bank / Flow River

## PART I: PRELIMINARY SCREENING

| YES | NO | |
|---|---|---|
| X | ___ | Applicant is eligible entity (Note: NRAC Committee may require documentation of cost-effectiveness) |
| X | ___ | Complete application received by deadline |
| X | ___ | Applicant has included a soils map and a topographic map. |
| ___ | ___ | Applicant has either a certified copy of a signed letter of intent, or original signature(s) from seller, indicating he/she is willing to sell the subject property (or sell a conservation easement on it) for preservation purposes, and that this land or easement acquisition will be completed within 6 months of receiving grant (or funding may be revoked). |
| X | ___ | Project funded during this round will be completed within 24 months of grant acceptance (or funding (may be revoked). |
| ___ | X | NRAC Funds are used to cover administrative costs (If yes, please list specific costs). |
| X | ___ | Applicant is ready and able to complete project (if the project is not initiated within 6 months the grant may be revoked) |

Project purpose must involve at least one of the following from A. or B. below:

**A. Open Space** (per Ohio Revised Code Section 164.22 A)

_____ acquires land for parks

_____ acquires land for public forests

_____ acquires land for wetland preservation or restoration

_____ acquires land for natural areas protecting endangered species

_____ acquires land for other natural areas, including hillsides and valleys

_____ acquires land for connecting corridors for natural areas

_____ openspace acquisition

_____ permanent conservation easement

_____ constructs or enhances facilities necessary to make open space area accessible & useable by the general public

**B. Riparian Corridors** or Watersheds (per Ohio Revised Code Section 164.22 B)

X Protects or enhances riparian corridors and watersheds, including the protection and enhancement of streams, rivers and other waters of the state. (Affected watersheds or sub-watersheds must be identified)

C. Would the project:

YES NO

___ ___ initiate or perpetuate hydromodification projects such as dams, ditch development or channelization?

___ ___ fund current legal obligations (such as fines, penalties, litigation, expenses, mitigation or reclamation) under state or federal laws or local ordinances?

___ ___ fund facilities other than those required to provide public access to or use of openspace?

___ ___ fund facilities for active recreation, such as tennis courts, ball fields or recreation centers.

___ ___ fund bridges other than foot bridges, walk/bike trails (with NRAC funds)

*If Yes to any of the above in Section C, the project is ineligible (Section 164.22, ORC).*
*If project meets Part I requirements (Preliminary Screening), continue to Part II, III and IV.*

*Any applicant submitting false, misleading documentation in any application shall be excluded from funding consideration in the particular program year being applied for. Furthermore the applicant shall be penalized in future funding years up to 5 points a year for a maximum of 2 years.*

## PART II: PROJECT EMPHASIS

NRAC's shall consider all the following in approving or disapproving a grant: Does the project emphasize (document in application) the following pursuant to Section 164.22, ORC? TWO (2) POINTS EACH (36 POINT MAXIMUM). Please refer to Glossary of Terms.

### OPEN SPACE

1. X reduces or eliminates non-native, invasive species of plants (and revegetates with native species).
2. X preserves or increases high quality, viable habitat for plant or animal species, including native species.
3. X preserves or restores other natural features that contribute to quality of life and state's natural heritage.
4. X incorporates aesthetically pleasing and ecologically informed design including sensitivity to the terrain, natural resources and heritage of the property.
5. ____ enhances educational opportunities and provides physical links to schools and after school centers.
6. ____ includes linkages to other parks, openspace/greenspace preserves, population centers, and lower income areas.
7. X supports openspace/greenspace planning, and preserves lands as recommended within previously identified planning or natural resource management documents.
8. X provides access to natural areas that result in recreational, economic, or aesthetic preservation benefits.
9. ____ provides or enhances areas where safe fishing, hunting and trapping may take place in a manner that will preserve balanced natural ecosystems.
10. ____ enhances economic development that relies on recreation and ecotourism in areas of relatively high unemployment

### RIPARIAN CORRIDOR

12. X preserves or restores functioning floodplains, including groundwater recharge areas.
13. X preserves or restores water quality and/or aquatic biological communities.
14. X preserves or restores natural stream channels.
15. X preserves or restores streamside forests, native vegetation or adjacent habitat.
16. ____ preserves existing high quality wetlands or restores wetlands.

**PART II. Continued**

17. ____ permanent acquisition of riparian corridors, watersheds, forested hillsides, or greenspace linkages.

18. X plants vegetation or reforests lands for filtration to improve water quality, or to control stormwater runoff.

19. ____ preserves headwater streams.

PART II SCORE: 22

## PART III: NRAC SCORING METHODOLOGY - Required

NRAC's shall consider the following in approving or disapproving a grant:

1. Percentage of Clean Ohio matching funds necessary to complete project
(Local match can include bargain sales, where seller provides at least a 25% price reduction below fair market value as a matching contribution).

2

____ 75 % (required-0 pts) X 74-70% (2 pts) ____ 69-65% (6 pts) ____ 64-60% (8 pts) ____ <60% (10 pts)

2. Level of collaborative participation: Participation means active involvement through in-kind services or funding as defined by District 2 NRAC (LETTER OF SUPPORT IS REQUIRED). (give 1 point if any of the following are met up to a maximum of 3 pts):

7

X local political subdivisions ____ state agencies ____ federal agencies

____ community organizations ____ conservation organizations ____ local business groups

3. Level of conservation coordination with other Openspace, Riparian Corridor, Farmland Protection or Urban Revitalization Projects under the Clean Ohio Fund in this or other Public Works Commission districts (PLEASE DOCUMENT).

____ is a joint project in more than one district (2 pts)

____ is a joint project in this district (1 pt)

____ carries out an adopted community, watershed or other plan overlapping another district (1 pt)

4. Community benefits: Relative economic, social/recreational and environmental benefits the proposed project will bring to the geographical area represented by the NRAC as compared to other projects.

4

X economic (2 pts) X social/recreational (2 pts)

5. Extent of public access once project is completed (if applicable check one, maximum 2 pts)

2

X The project includes the construction or enhancement of facilities (not funded by NRAC) that are necessary to make an open space area accessible and useable by the general public (2 pts).

____ Is a fee simple acquisition of lands for the purpose of making riparian corridors accessible and useable by the general public (2 pts).

6. Operation and Maintenance once project is completed

4

X operation plan and infrastructure, if appropriate, in place (4 pts)
____ operation plan, no infrastructure (2 pts)
____ limited operation plan, volunteers available (1 pt)
____ no operation or maintenance plan in place (0 pts)

7. Project Management Experience of similar or related projects )DOCEMENTATION REQUIRED IN APPLICATION)

2

____ successfully completed 3-5 similar projects in the last 10 years (3 pts)
X successfully completed 1-2 similar projects in the last 5 years (2 pts)
____ has partnered on at least one similar project in the last 5 years (1 pt)

PART III SCORE: 15

## PART IV: COMPLIANCE WITH HAMILTON COUNTY PRIORITIES

The NRAC may adopt additional criteria which reflect local priorities as long as the criteria compliment, and do not negate, PARTS I-III which carry out ORC Sec. 164.20-164.27.

3 1. Community Planning: Project is in concert with publicly-adopted regional, local neighborhood or community advisory association plan, watershed plan, or greenspace plan (may include adoption by governing bodies, planning commissions, park districts or similar boards or commissions appointed by the governing body of a political jurisdiction). (3 pts).

2. Natural Resource Viability: How important is the project to the viability of the natural resources affected by the project (VERIFIABLE DOCUMENTATION REQUIRED) (give 1 point for each that applies, 3 point maximum):

3
- X protects a federally listed endangered species or biological community
- ____ protects more than 5 State Natural Heritage Inventory (NHI) endangered species
- X protects 1-5 State NHI ranked rare species
- ____ protects a high quality example of a regionally endangered biological community
- X protects a threatened biological community or important example of Ohio's natural heritage. Part IV, 4

3 3. Project preserves or naturally restores steep hillsides with slopes of 20% or greater and/or project preserves or naturally restores steep slopes of 20% or greater in combination with stream bank erosion control measures (3 pts).

3 4. Project preserves or enhances undeveloped lands along viewsheds of major highway and transportation corridors (3 pts).

2 5. Project protects highly erodable lands or hydric soils (3 pts).

2 6. Project addresses a situation where action must be taken now or opportunity will be lost forever (3 pts) (Documenting evidence as to how opportunity will be lost must be submitted)

PART IV SCORE: ~~14~~ 14

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**SUMMARY SCORE:**

PART II 22
PART III 15
PART IV ~~14~~ 14
**TOTAL** 51

**RANKING AMONG ALL PROJECTS:** ~~#74~~ #53 50

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**OHIO PUBLIC WORKS FOR YOU**

*THE OHIO PUBLIC WORKS COMMISSION*
65 East State Street, Suite 312, Columbus, Ohio 43215-4213



10/07/2005

**Jack Sutton**
**Director**
**Hamilton County Park District**
**10245 Winton Road,**
**Cincinnati, OH 45231**

**Subdivision Code : 061-02037**

**Dear Mr. Sutton,**

Your request for financial assistance from the Ohio Public Works Commission has been approved for the project entitled **Whitewater River Bank Stability Project** in the amount of **$ 353,980**. This Grant has been assigned project number **CBCAG**. Please use this number when calling or writing our office.

The enclosed Project Agreement defines **Hamilton County Park District**'s responsibilities in accepting this financial assistance. Please review it carefully to ensure that the project has been accurately described and defined throughout the agreement's appendices. If any errors are found, or if any information needs to be updated, please contact us immediately.

Please execute the Project Agreement by signing both copies. **You must return one fully executed copy to the Commission within forty-five (45) days,** and retain the other for your files. This project may not proceed with acquisition, construction or purchase of materials, **until you have completed the following;** 1) returned one executed copy of the agreement to OPWC, 2) prepared and sent to OPWC a "Request to Proceed" 3) received approval from OPWC on your "Request to Proceed"

The Project Manager and Chief Financial Officer named in the agreement will each receive a separate mailing that explains their respective duties regarding project implementation. The Project Manager has also received a reference copy of the enclosed Project Agreement for their records. All of our project management related documents for the Clean Ohio Program are located at our Web page at **www.pwc.state.oh.us.** Once there, click on the link titled **"Clean Ohio Program".**

If you have any questions about any aspect of the program, please do not hesitate to call your Program Representative, **Michael Miller**, at **614/752-9343**.

Sincerely,

W. Laurence Bicking
Director

cc: District Committee